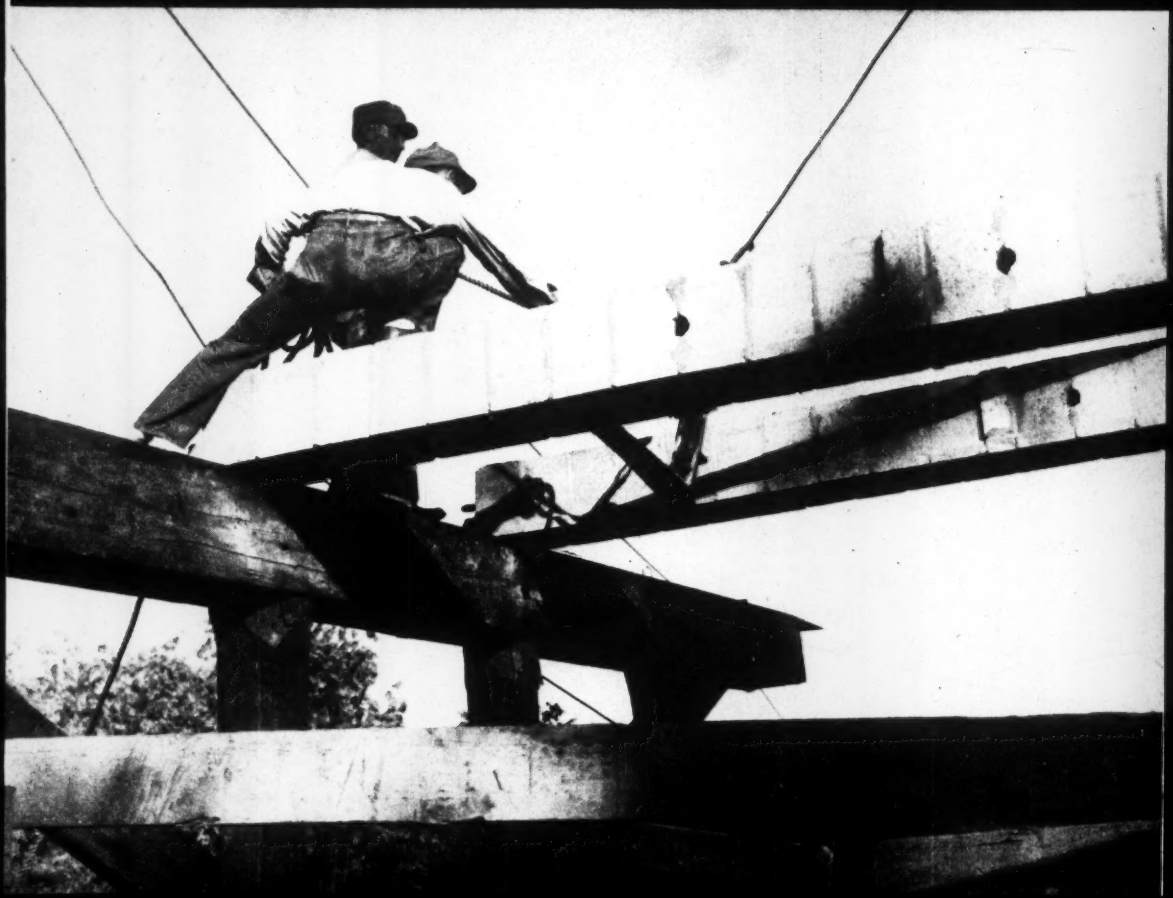
ENGINEERING NEWS-RECORD

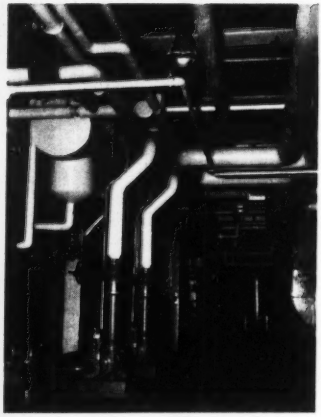


A McGRAW-HILL PUBLICATION

Another Steam Plant Picks

BYERS WROUGHT IRON PIPE

and Protects 17 Vital Services



Wrought iron condensate and miscellaneous water lines in new steam plant.

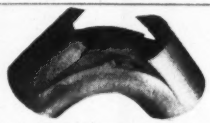
In the million-dollar steam generating plant of the Jeffrey Manufacturing Company, Columbus, Ohio, pipe materials were carefully selected to meet service conditions . . . so, for 17 varied services facing corrosive hazards, the designers selected wrought iron pipe to forestall the maintenance threat of early failure and costly replacement.

Over 19 tons of Byers Wrought Iron pipe, in sizes from ½ to 12 inches, was installed in these punishing services: boiler blow-off piping; water walls and columns to blow-off tank; atmospheric exhaust piping from safety valves; atmospheric vent piping (except plumbing vents); condensate piping; overflow, drain and chemical piping; raw and softened city water lines; cooling water supply and return lines; and all above-ground soil waste lines, plumbing drains, vents and downspouts. Portions of the installation are shown in the pictures. A. M. Kinney, Inc., consulting engineers, were responsible for these sound specifications. Lieb-Jackson Co. handled the fabricating.

Because conditions vary so widely, all of these services may not be problems in your plant. One, however, is always a headache—condensate returns. Condensate is invariably aggressive, and while treatments of various kinds may help, the only basic solution is the installation of corrosion-resistant material. Wrought iron has been so uniformly successful in this service that it should be considered whenever you are aiming for maximum durability.

Power plants in all sections of the country depend on the time-tested durability of wrought iron. In a number of reported cases, wrought iron has doubled, tripled, even quadrupled the useful life previously obtained from low-first-cost piping material.

If you are contemplating new construction, or extension or replacement of existing piping services, you'll find it profitable to check up on the performance of wrought iron. Our bulletin WROUGHT IRON FOR PIPING SYSTEMS discusses some of the corrosive conditions found in various services and illustrates a few of the many places where engineers have successfully applied wrought iron . . . ask for a copy.



WHY WROUGHT IRON LASTS

This notch-fracture test specimen illustrates the unusual fibrous structure of wrought iron—which is responsible for the unusual corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

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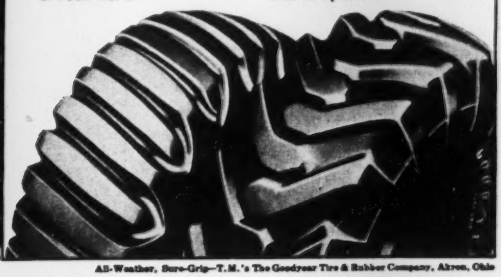

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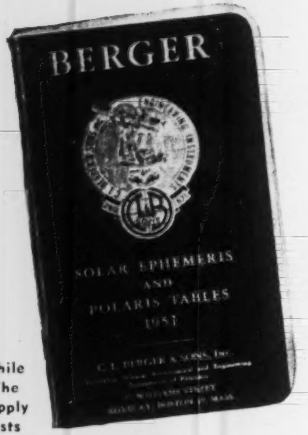

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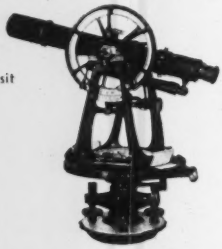

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ENGINEERING NEWS-RECORD

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Volume 146 JANUARY 18, 1951 No. 3

WALDO G. BOWMAN
Editor

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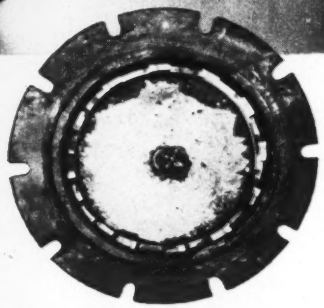

LARGE PHOTO: Tapping a 16" outlet in a 36" pipe at Wayne County, Michigan.

SMALL PHOTO: The pilot drill of the tapping machine withdraws the concrete core, making a clean cut, and leaving no obstruction within the pipe line.

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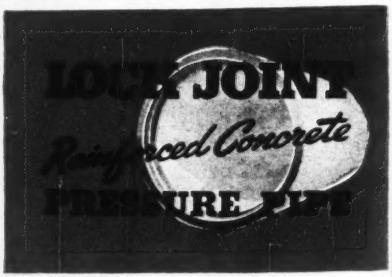

The illustration shows a Murphy Diesel rated at 150 H.P., continuous, powering a Nordberg Symons Cone Crusher.

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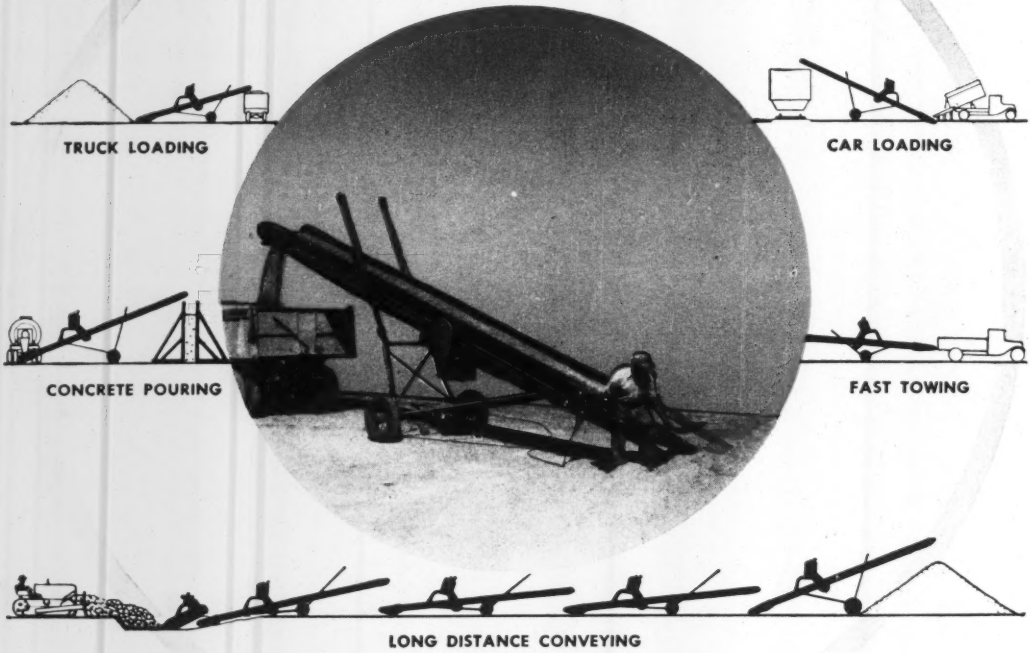

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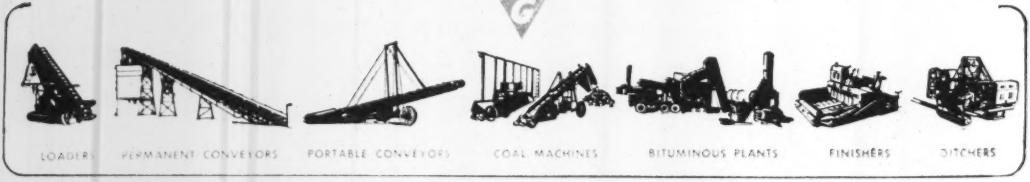

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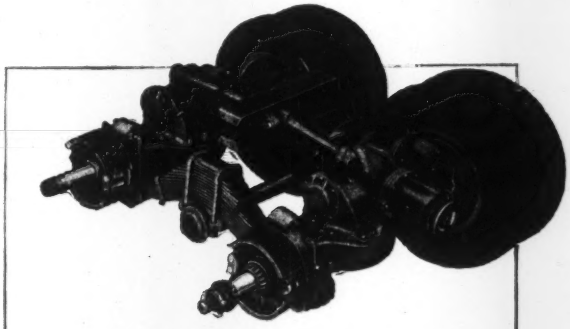

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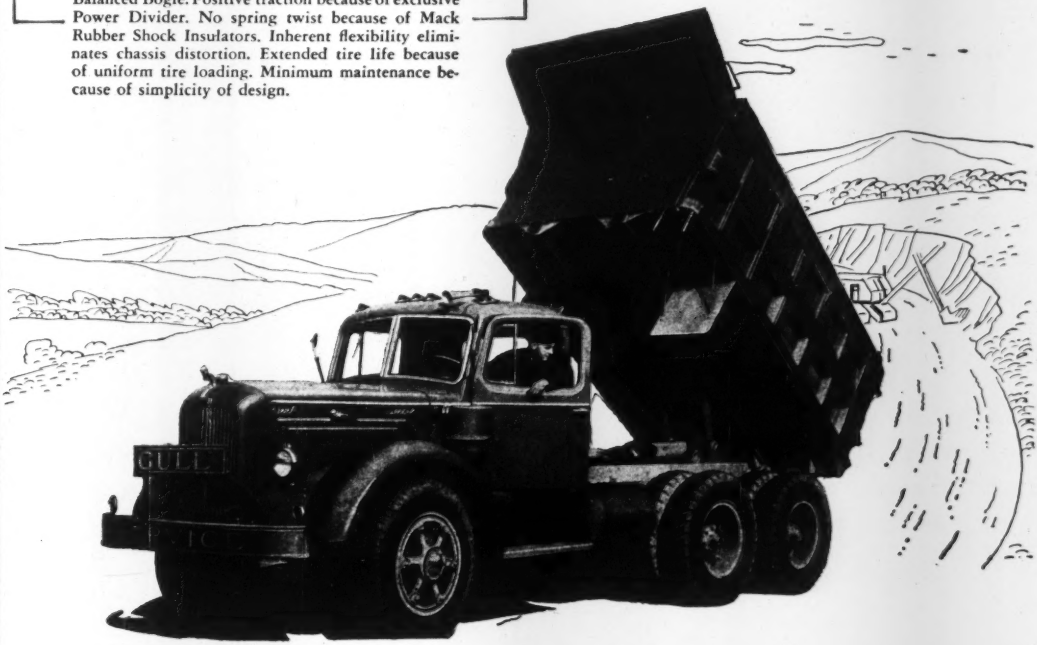

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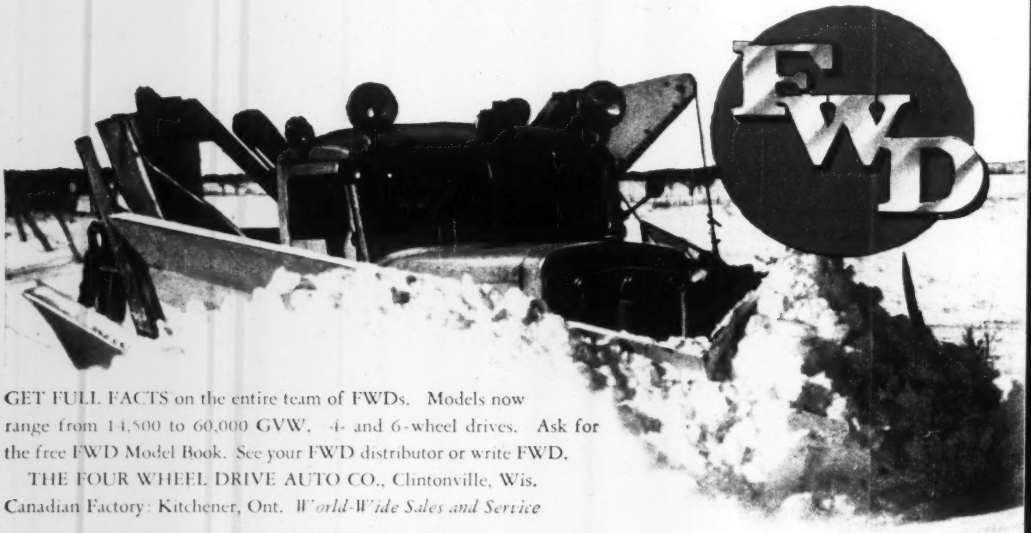

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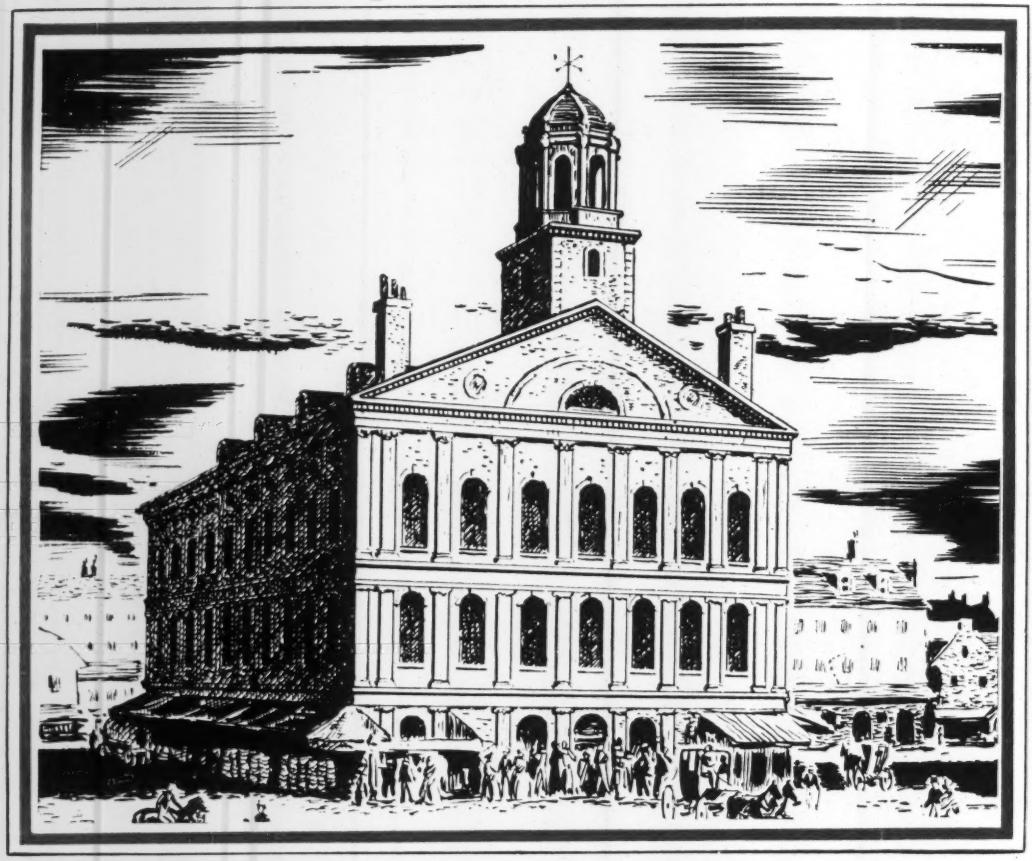

Boston's Faneuil Hall, popularly called "The Cradle of Liberty", as it looked 100 years ago.

Boston, Massachusetts, has cast iron water and gas mains in service that were installed more than a century ago. In those days, modern pavements were unknown; labor costs were low. Today, the expense of unnecessarily frequent repairs to underground mains, or untimely replacements, and consequent restoration of costly pavements, is a risk you cannot afford to gamble with. Cast iron pipe has an established record of long life and low maintenance. It effectively resists corrosion and possesses the four strength factors so necessary to meet the stresses imposed by modern traffic and crowded underground construction. These are shock, crushing, bursting and beam strengths. No pipe deficient in any of these strength factors should ever be laid in paved streets of cities, towns and villages. **United States Pipe and Foundry Co., General Offices, Burlington, N. J. Plants and Sales Offices Throughout the U. S. A.**

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NEWS BRIEFS

Snow destroys courthouse—In the snowstorm of late November, the roof of the 75-year-old Jefferson County courthouse at Steubenville, Ohio, collapsed under the weight of snow with damage estimated at $200,000. County commissioners have decided to have the structure torn down.

Pedestrian loses—Joseph Dubord sued the city of Montreal, Can., for $1,358 because he broke his ankle when he fell on an icy sidewalk where firemen were battling a fire. The claim was thrown out because the judge said the plaintiff, seeing that ice was forming around the hydrant, should have gone home some other way.

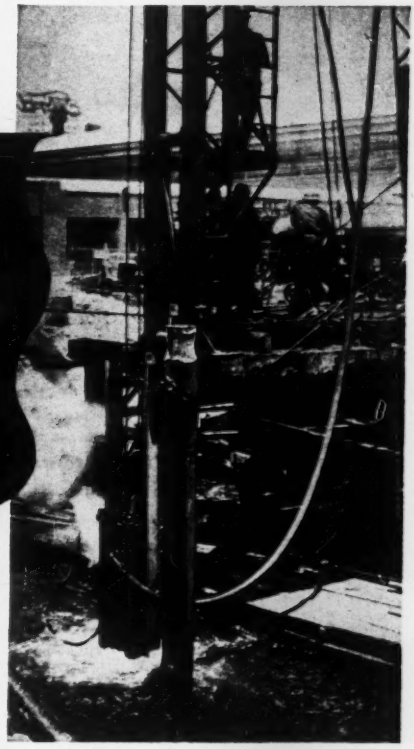
To save spiral bridge—The Dakota County, Minn., Historical Society will take over and maintain the Hastings, Minn., spiral-approach bridge over the Mississippi River. The bridge, built in 1894, is believed to be the only one of its kind in the United States. (ENR June 22, p 54). Fred Lawshe, South St. Paul, president of the society, said that the Dakota County commissioners have guaranteed $100 a year toward upkeep of the bridge, and he said the society hopes to make the bridge partially self-supporting by charging admission to it.

Aluminum for defense—The first pig of national defense aluminum to be produced by reactivated facilities of Aluminum Company of America at Badin, N. C., has been presented to General Services Administrator Jess Larson for the defense stockpile.

• **Midnight panic** held sway in Phoenix, Ariz., when three contractors poured foundations on 125 houses the night of Dec. 7 spurred by rumors of a 12:00 PM government deadline on use of critical construction materials. Around 500 yds of concrete was poured with ditchers following hurriedly-laid-out lines with mixer trucks close behind. Work was lighted by floodlights, auto headlights and portable power plants. FHA inspectors checked excavations by flashlight. When government deadlines did not materialize, the only happy participants in the rush were workers earning time and a half for overtime.

A 14-hour drought—Recently, the 132,840 people in Fort Wayne, Ind., were made to realize the truth of the proverb, "When the well is dry one knows the worth of water." They

PILE DRIVING under water



McKiernan-Terry 11-B-3 Double-Acting Pile Hammer driving 85-ft. steel H-beams for the 4000-ft. bridge over Cerritos Channel. Terminal Island, Cal. Proctor & Kuhn, sub-contractors to United Concrete Pipe Corp.

1170 STEEL PILES had to be driven under water during the construction of this longest, highest vertical-lift bridge on the Pacific Coast. 390 steel piles, 85 feet long, were hammered full length, without follower, into unstable soil to required elevation. At cut-off the anvil block or base of the hammer was 12 feet below the surface of the water. In addition, 780 shorter piles were driven for the lift-span piers. • McKiernan-Terry Double-Acting Pile Hammers were chosen for the job because (1) they were the first pile hammers developed for underwater driving and (2) they have held an unsurpassed reputation for underwater driving dependability through the years. • 17 sizes of hammers and extractors are available in the complete McKiernan-Terry line. Write for bulletin giving all the facts.

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Above is the pit and plant of Albuquerque Gravel Products Co. with a 4 cu. yd. Sauerman Power Drag Scraper digging and hauling the 250 t.p.h. needed to keep this modern plant humming.

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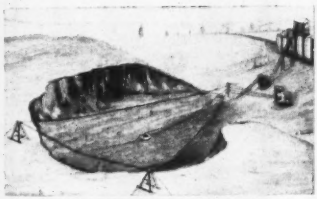
Sauerman excavators are of two main types—power drag scrapers and slackline cableways. Either of these two machines will span a large area and move material at a rapid rate from point to point anywhere within that area, under finger-tip control of one operator.

Of the two machines, the Sauerman power drag scraper has the wider application as a general purpose excavator and stockpiler. The slackline cableway finds its greatest usefulness when the job calls for digging deep, particularly under water, and lifting to a high delivery point.

Both machines are alike in their simplicity, ease of operation, moderate power requirements, low maintenance expense and their ability to work on any kind of ground. Every Sauerman machine is carefully engineered and constructed to give long, trouble-free service and to stand up under tough digging and heavy loads. Many Sauerman machines in operation today have been running for more than a quarter of a century and still are considered just about as good as new by their owners.

Write today for our catalog. If you have a material handling problem that is bothering you, tell us about it and our engineers will give you their ideas as to the equipment and methods best suited to your requirements.



HILLSIDE EXCAVATION

The picture shows how a Sauerman scraper digs into a hill of hard-packed glacial gravel and moves the gravel to a crushing and screening plant.

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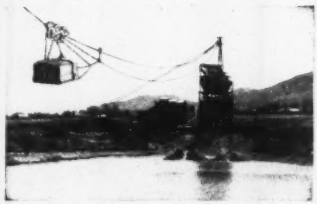
Small Sauerman scraper handles seasonal storage of 30,000 tons of surplus output annually at crushing plant, piling the surplus material in a single long pile and later reclaiming to a car-loading hopper.



DIGGING UNDER WATER

Here is a Sauerman slackline cableway moving gravel out of a deep pit 400' wide by 900' long which it dug during the last two seasons while producing about 300,000 cu. yd. a season.

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were without water for 14 hours when debris clogged an intake valve at the city filtration plant. Fruitless efforts were made to back flush the emergency intake to free it of debris, and two Navy divers went to work on the clogged screen covering the intake pipe. Raw water from reservoirs was diverted into the system and until the emergency was over the public was instructed to boil all water for drinking or culinary purposes.

George Washington slipped here—but not very much. This refers to his survey for the boundaries of the District of Columbia more than a century and a half ago. When the father of his country surveyed the southwest boundary of Arlington County, Va., he deviated from a true line by 1 minute and 14 seconds at one bearing point. Authority for this is J. R. Wigglesworth, chief of the Arlington County survey department. Mr. Wigglesworth said, "Frankly, I think Washington did a wonderful job, considering what he had to work with." It seems that when he did this work in 1791 he had only a compass set on a wooden stand with peepsights—no high-grade transits with telescopes worth $500.

Toll-free senator—The Pennsylvania Turnpike Commission has presented to Ex-Governor, now Senator James H. Duff a leather-bound, gold, lifetime pass good for free rides on the turnpike. The commission said that it was Governor Duff's vision, faith and confidence that made possible the new 100-mile Philadelphia extension and the 67-mile Western Extension now under construction.

A 9-man staff—Dissatisfied with past experience with outside engineers, the Anchorage, Alaska, city council has added nine men to the staff of City Engineer Charles Tryck to plan a public works program.

Precast concrete bridge spans—A precast concrete bridge factory has been started at Calgary, Alta., to build concrete bridge spans and curbs for shipment to road contractors in various parts of the province. Designed by A. L. Thorsen, civil engineering professor at the University of Alberta, the spans can be cast in lengths of 20, 28, or 40 ft, and are three ft wide. About two bridges per day can be turned out at the plant of Concrete Structors Ltd., an affiliate of Alberta Transit Mix Concrete Co. Ltd., Calgary. The bridges already have been placed on sections of the new paved trans-Canada highway near Strathmore, Alta.

Raymond conquers *chubascos*...in

THE WORLD'S MOST UNUSUAL SOIL BORING JOB

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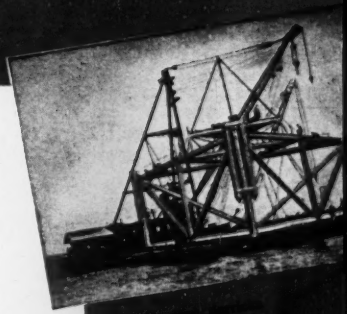
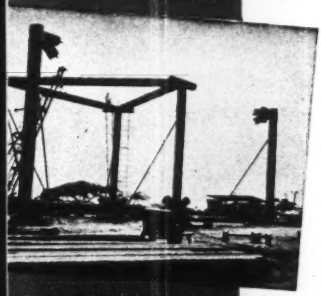
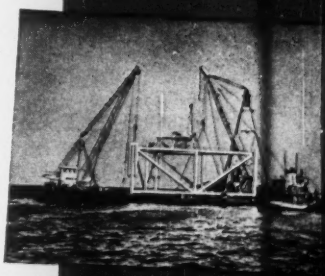


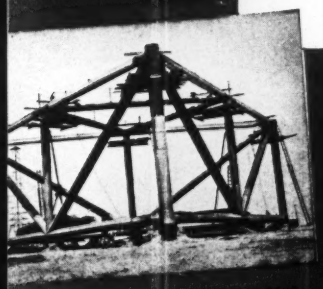
The Problem: 250-foot Gow soil borings, accurately spotted five to ten miles offshore in the deep waters of Lake Maracaibo, Venezuela. The Project: pile foundations for future oil-well derricks. Special Hazard: 70-mile-an-hour "chubascos," violent squalls that would wreck temporary platforms.

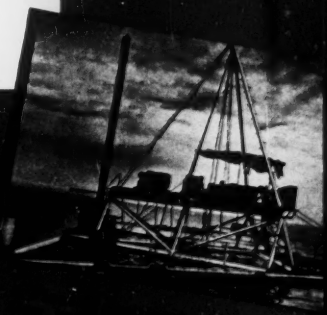
The Solution: Raymond engineers designed a triangular *floating* platform of 22" steel pipe, welded and watertight. The three corner members were left open for 120-foot-long anchor spuds. Assembled on shore from steelwork fabricated in New York, the 60-ton float was skidded onto two barges and towed 32 miles to the first boring location where floating derricks launched it. Spuds and deck equipment were placed later, including winch-controlled anchors at each corner to help in spotting the float and holding it steady during boring operations.





The Moral: When the problem is tough, the answer must still be *right*. That's when it pays to have a resourceful, experienced organization on the job . . . like Raymond!





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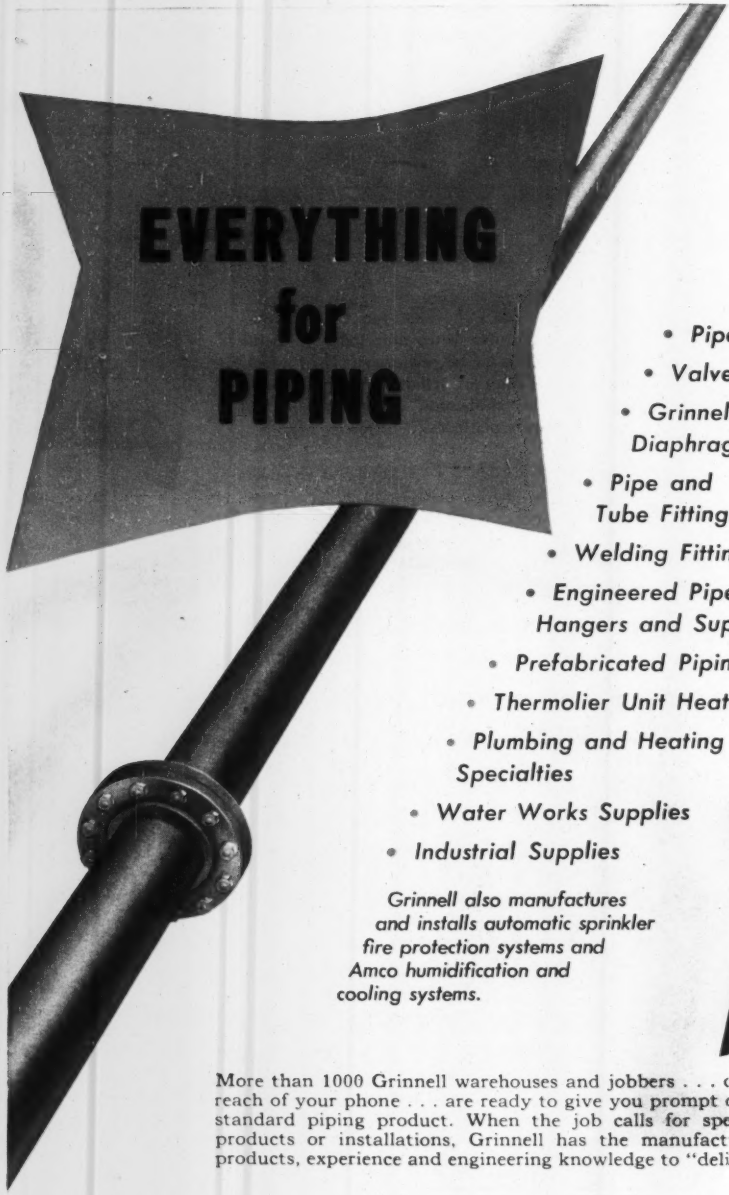

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THE CONSTRUCTION WEEK

CONSTRUCTION WAGE STABILIZATION—Voluntary stabilization of construction wages (an early development in WW II), is getting consideration again. Representatives of AGC, the AFL Building Trades Dept., the Labor Dept. and government procurement agencies met recently to discuss the problem. They stressed particularly the big Atomic Energy Commission project in South Carolina and other proposed defense construction. One suggestion: Permit contractors to pay higher wages in areas where wages are low and labor is scarce.

HOUSING IS BIG BUSINESS—Total housing starts for 1950 are close to 1,400,000. December turned up a surprising 92,000—contrary to the normal trend over past years. Government is standing by its goal of 800-850,000 new units in 1951. Barring a colossal setback (such as a WW III) it appears that there will be at least that many starts.

STREAM POLLUTION LAWS IN PROSPECT—The Administration is planning to ask Congress for a complete overhaul of the laws to prevent stream pollution—with a leaning toward greater federal participation. Legislation will be based upon findings and recommendations of the President's Water Resources Policy Commission (ENR Dec. 21, p. 23). Truman probably will not be able to get a plan before the lawmakers until early spring.

DEFERMENTS TO GET TOUGHER—The construction industry—like many other key industries—may have to scramble for personnel during 1951. Many draftees now rejected probably will be called in the future. A system of limited service for the handicapped, being worked out, will free as many as possible for combat units. Net effect of changes planned will be universal military service.

POLICEMEN NEEDED—Policing of production-control and price orders requires a sizeable organization, with regional offices. National Production Authority and the Economic Stabilization Agency will need about three months to set up the compliance divisions required. More federal employees will be needed.

HIGH COLUMBIA HALTS CONSTRUCTION—With the Columbia River water level six ft above its 15-year average for early January, construction operations at Chief Joseph Dam (ENR, Sept. 14, p. 136) virtually have come to a standstill. The high water makes it impossible to install current deflectors for driving steel sheet piling for the cofferdam.

HOOKED BARS SAVE STEEL—A proposed revision of the American Concrete Institute building code is practically assured of adoption at ACI's 47th annual convention, Feb. 20 to 22, in San Francisco. The revision requires all plain bars to be hooked. Bars satisfying the American Society for Testing Materials Specification A305-49, however, are considered to develop sufficient anchorage by bond alone and are equivalent to special anchorage with the old-type bars. In most cases, hooks will be unnecessary with the new-type bars.

HIGHWAYS FOR DEFENSE—Gov. Paul A. Dever of Massachusetts announced that so-called "luxury road-building" is out in his state for the duration of the present national emergency. He said, "The only road construction to meet my approval will be that with a definite defense utility, either for military use or for service in evacuation."

INLAND DATA for STEEL USERS

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The role of Scrap in Steel Making

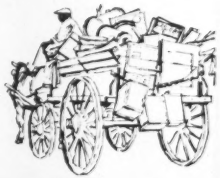
One of the most important raw materials in steelmaking . . . one frequently underrated by the casual observer . . . is iron and steel scrap. With over 90% of all the steel in the U. S. being made by the open hearth process, the scrap used by steel producers totals approximately 50,000,000 tons each year.

The open hearth method of steel production is geared to a pig iron scrap consumption ratio of roughly 50-50. This is to the final advantage of the steel user, since a large scrap diet in steelmaking results in a number of benefits: (a) steel is made faster (since scrap has already been "refined" once before, the "melt" time in the open hearth is decreased); (b) vital raw materials are conserved (it takes almost 4 tons of iron ore, coal and limestone to make a ton of pig iron); (c) unless scrap prices are abnormally high, the price of steel is cheaper; (d) steel is of higher quality (since scrap has already undergone one refining process); (e) transportation facilities, instead of being used for the additional raw materials otherwise required, can be released for other uses; (f) steel mill capacities can be expanded more readily with less emphasis on the blast furnace and more on open hearths and rolling mills.

About two-thirds of the scrap consumed in making steel comes from the steel mills themselves. Crop ends and sheared edges move quickly back to the open hearth shop. The remaining third, flowing to the mills largely through the 6,500 scrap dealers in the U.S., comes from the wastage in metal working plants ("production" scrap), auto graveyards, old building, bridge and ship wrecking projects, railroads (worn rails, freight cars, etc.), neighborhood junk peddlers.

The scrap dealers must sort the scrap so that the undesirables are eliminated, the alloys segregated and the right kinds of scrap can be delivered in large tonnages to the mills for most efficient steelmaking practice.

Today, with steel production at record peaks and with capacity continually expanding, it is more important than ever to keep scrap flowing back to the steel mills from *every* source. Everyone waiting for steel can help himself by assisting the movement of his scrap through his regular channels.



THE SCRAP CYCLE

CONSTRUCTION TRENDS

WAGE CONTROLS A MAJOR U. S. PROBLEM FOR 1951.

Some prices have already been controlled, and general price ceilings are expected early this year. But prices can't be held down while wages—the biggest cost item—go on rising. With a price freeze in prospect, businessmen are wondering how government plans to keep wage costs in line.

Congress tied wage stabilization and price control together when it wrote the Defense Production Act. But until recently, the Administration avoided the problem, implied that wages could be left free because price controls would be only limited. The big unions went on record against any kind of wage control.

Retreat in Korea changed the picture. With faster mobilization, full controls, including wage controls, became inevitable. The unions accepted the idea—with reservations—last December.

Prospect now is that wages will be stabilized as price ceilings are put into effect, as the Defense Production Act provides. But it may take a major labor dispute like a steel, coal or railroad strike to bring on overall wage controls.

LAST WAR—CONTROLLED INCREASES—Wage control worked in the last war—within limits. The War Labor Board didn't "freeze" wages absolutely. But, using the Little Steel formula, it held wage increases to a minimum.

ENR statistics on construction wages show a rise of 18.3% in common labor wage rates between 1941 and 1944. That's nothing compared to the postwar rise—48.2% between 1945 and 1948. Wage rates for skilled construction labor rose 8.7% between 1941 and 1944, 35.5% in 1945–1948.

Actually, labor cost went up during the war a lot more than wage figures show. The War Labor Board gave workers benefits in other forms—through "fringe" decisions on paid holidays and vacations, shift premiums, pensions and other non-wage benefits.

MORE INCREASES IN PROSPECT—In 1951, controlling wages may be a lot harder and labor costs may rise much more.

Unemployment was high when the last war started. That took pressure off the labor market, gave Washington time to develop wage controls.

1951 is different. Unemployment is low—slightly over two million—so businesses have to bid against each other for labor. And business is proving willing to pay in order to keep the workers; wages have been going up in industry after industry since early last July.

And this time—unlike last—a rapidly increasing number of labor contracts call for periodic, automatic "productivity" increases and for adjustments to make wages keep up with the cost of living.

These contracts add to inflation. As prices rise, workers get more money—which helps bid prices up farther. But the unions say existing contracts must be honored, even though they are inflationary. The way to avoid cost-of-living increases, say union leaders, is to control inflation with taxes and price controls.

But Washington observers expects inflation to continue, even with full price controls. And unions expect to keep their old contracts. If they do, wages will go up as the cost of living rises—and add more fuel to the fires of inflation.

Unions also want controls to be flexible. They want increases granted to relieve "inequities" within or between industries. More stress probably will be put on fringe issues, such as pensions and paid holidays, in future wage negotiations.

Washington still has no definite policy for settling these issues. But, when one is announced, it's not expected to differ much from what the unions are asking.

Already, it looks as if cost-of-living escalator clauses have the government's OK. A representative of the President helped try to settle the railroad dispute by granting a cl clause—and the government would hardly approve that contract and then throw it out within the next few months.

CONSTRUCTION WAGES—GOING UP—Government approval of cost-of-living contracts would mean higher wages in construction.

Government policy on cost-of-living contracts affects construction, even though most of the contracts are in manufacturing. Construction has to compete with other industries for labor. If the auto companies, for example, keep raising wages to match living costs, construction loses workers to the auto industry. The only way to keep those workers is to meet the auto companies' offer.

The government has to allow some increases, partly because the unions insist, partly to attract new workers —women and older people—into the labor force.

With the labor supply getting tighter through the year, construction will have to match the increases to keep its workers.

Once wage controls are fully established, wage increases probably will slow down. But, as long as mobilization puts abnormal pressure on the labor force, labor costs will keep going up. If the experience of the forties is repeated, they will go even higher after the mobilization period ends.

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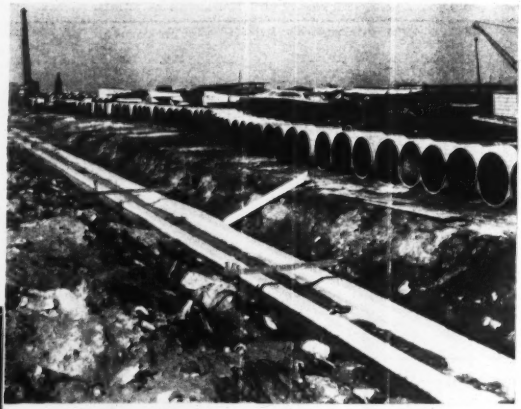

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Why Build Large Bomb Shelters?

A STUDY OF THE PLANS being proposed by municipal officials for protecting urban populations against bombs should make it clear that only relatively few people can be accommodated in community-owned facilities. Consequently, since equal protection cannot be provided for everyone, it does not seem logical to build a few large bomb shelters with public money.

In New York City, for example, city officials propose constructing garages and sections of an underground rapid-transit system to serve also as bomb shelters. Although several million people come into Manhattan to work every day, the proposed shelters would hold but a few hundred thousand, even with standing room only.

And if the shelters could be made large enough to accommodate everyone, only a few people would ever get a chance to use them. In the estimated time available between the first warning of an impending air raid and the dropping of bombs—8 to 15 min.—it would be impossible to empty large office or apartment buildings and transport tenants to the proposed garages and subways. Probably, panic would kill more people than the bombs, if this were tried.

Civil defense funds could be much more usefully employed in (1) providing on-the-job shelters for all essential defense workers; (2) promoting construction with private funds of individual or group shelters in office and apartment buildings, and even in small houses; (3) providing shelters in important public buildings, such as schools and libraries; and (4) educating the public on what to do when an air-raid warning sounds.

Our defense effort can be successful only if production in essential industries is kept at a high level. Obviously, without a sufficient number of adequate personnel, production would drop. Therefore, to prevent the depletion of our essential labor force by enemy air raids, we should go all-out to protect it. Highest priority should be given to construction of group bomb shelters for defense workers.

For the rest of the population, a logical solution is to build bomb shelters in each building—and in the larger ones, on every floor. In many structures of fire-resistant construction, suitable protected areas can be provided at relatively low cost in lobbies and in fireproof stairwells. These can be designed to protect against almost everything but a direct hit with a high-explosive bomb or an atom bomb, which would demolish the structural frame of the building.

Since most shelters will be in privately owned buildings, public participation in the cost appears impractical. They will have to be built by the owners. Individuals or groups could spend as much money as conditions warrant, depending on the degree of protection and comfort they wish to incorporate in the shelters. Government's function should be to assist in an advisory capacity and to stimulate owners to act promptly to protect their tenants.

Bridge of Distinction

THE FIRST PRESTRESSED BRIDGE in the United States was completed last October. But it wasn't the Walnut Lane Bridge in Philadelphia—the one that nearly everybody expected would be first. It was a highway bridge in Madison County, Tenn. (p 39).

That structure consists of a cast-in-place concrete deck carried on beams 20 and 30 ft long. Placed side by side, these beams were made of precast concrete blocks compressed to form a monolithic unit by tensioning 7-wire galvanized strands. The job was done by the county highway maintenance crew. Prestressing took only three days, and the bridge was opened to traffic in less than two weeks after erection started.

While the spans of the Madison County bridge are relatively short, there can be no doubt that the same type of construction can be used for much longer spans—provided, of course, that the precast units are made larger. Eugene Freyssinet, in France, for example, has built five bridges over the Marne of precast-concrete sections prestressed to form girders spanning more than 240 ft. However, the prestressing technique used by Freyssinet differs from that used in Tennessee. Prestress is applied by cables composed of separated wires, which are tensioned simultaneously, anchored by wedging and grouted in place.

A comparison of the prestressing techniques used in Madison County with those employed for the Walnut Lane Bridge also is quite interesting, even though the fact that the latter is much larger is taken into account. While no special skills were required for the Tennessee structure, a subcontract was let to a specialist for the Philadelphia bridge. Prestressing was done rapidly in Madison County because preformed strands composed of 7 wires were tensioned (larger strands could have been used if desired) and end anchorages were simple. In Philadelphia, girders were prestressed by cables composed of from 24 to 64 wires 0.276 in. in diameter. Only two of these wires were tensioned at a time.

In comparison with other permanent-type designs, the Madison County Bridge appears to be relatively low-cost. Savings of from 40 to 50 cents per sq ft over conventional types of short-span bridge are reported. Since this was a pioneering job, much was learned that will make future jobs even more economical.

Much credit is due those who participated in the development of this method of construction—and particularly to Edwin C. Rogers, Madison County engineer and to Bryan and Dozier, Nashville consulting engineers, who acted while others dreamed.

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During the day, this corrugated flush-with-the-surface traffic marker, made with Atlas White Cement, forms a bright white guideline in contrast to the pavement grey.

At night, the saw-tooth faces of the marker catch headlight rays and reflect them back to the driver. And in rainy weather, the wet faces become even more mirror-like, giving good visibility when it is most needed.

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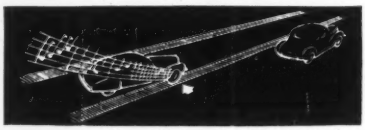

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ENGINEERING NEWS-RECORD

JANUARY 18, 1951 VOL. 146 NO. 3

Ban commercial construction in drastic freeze order

Directive, with teeth, halts most new building starts until Feb. 15 to permit NPA to set up controls through regional offices of Commerce Department

A freeze order on commercial building this week stopped virtually all new starts in that branch of construction until Feb. 15. By that date the National Production Authority will have construction controls staffs operating in the 14 regional offices of the Commerce Department.

These local offices will issue permits for such commercial jobs as will be subsequently permitted to go forward in their regions. If a builder goes ahead without a license, both he and the owner of the property are liable to fine or imprisonment or both, as stipulated in the original M-4 order of Oct. 26, banning amusement construction (ENR, Oct. 26, p. 23). Aside from the legal penalties, violators run the risk of not being able to complete their building jobs.

The new order, in fact, is a sweeping extension of M-4. It is the most dramatic and drastic action so far taken to demonstrate the real seriousness of the defense situation.

• **Timing important**—Effective at midnight, Jan. 13, the regulation was not released until two days later. That timing was not entirely accidental. The new order goes pretty far in saying that even jobs already started cannot proceed unless a substantial quantity of material has been incorporated in the structure. The requirement was written in order to shut off builders who had hurried to break ground in anticipation of such a restriction.

NPA has established a general rule that—up to Feb. 15—it will grant authorizations to start or continue new jobs only in emergency cases. On jobs where ground has been broken, the agency cautions contractors and owners to be careful about deciding whether construction has been legally commenced—under terms of the order—before proceeding with work already under way.

As an example of a legal start, NPA cites footings or foundations already in place when the order took effect. Where there is a doubt, the builder is to file an application with NPA.

In determining whether unreasonable hardship exists, the Agency's construction controls people will consider the extent of work already done and the financial loss that might result if work were halted.

• **Regional offices will handle**—Applications by builders are to be submitted on NPA forms to Commerce Department regional offices in Boston, New York, Philadelphia, Cleveland, Chicago, Atlanta, St. Louis, Kansas City, Dallas, Minneapolis, Denver, Seattle, Los Angeles and San Francisco.

In considering an application to start construction of a commercial building not directly related to defense, NPA will take into account the type and quantity of materials needed and on hand, as well as the effect on the community at large if the application should be rejected. Approval will be easier to get in areas where materials and labor are plentiful.

• **Exemptions**—Exempt from the order are supply facilities for food, fuel oil, gasoline, coal and gas distributing pipelines, as well as storage warehouses for manufacturers or processors. Alterations costing less than $5,000 in 12 months likewise need no permits.

Otherwise, commercial building is blanketed. The order gives a long list, from banks and office buildings to stores and restaurants.

Aimed strictly at commercial building, the order does not apply to schools, churches, hospitals, municipal construction or housing—either single-family or multiple-dwelling rental projects. Where an apartment building is to include stores or offices, however, authorization is required for the commercial portion.

Fast as NPA moved on the drastic order, it did not act quickly enough to satisfy its 29-man construction industry advisory committee. This group, representing all the principal branches of construction—from design to finance—met for the first time with James W. Follin, acting director of NPA's Construction Controls Division.

After hearing the alarming story of National Defense needs, the Committee approved the prohibitory order, though some members thought the timing faulty. Having approved it, the

(Continued on page 24)

Industry Advisory Committee acts

The Construction Industry Advisory Committee, consisting of 27 members appointed by NPA, is playing a large part in aligning controls to provide the greatest equity possible for all under the present emergency conditions. Committee members in the design section are:

Ralph Walker, president, American Institute of Architects, Voorhees, Walker, Foley & Smith, New York; Glenn Stanton, vice president, AIA, Glenn Stanton & Associates, Portland, Ore.; J. B. Converse, civil engineer, president, J. B. Converse & Co., Inc., Mobile, Ala.; J. N. Landis, mechanical engineer, The Bechtel Corp., San Francisco; Leo H. Cleary, electrical engineer, 1022 20th St., N. W., Washington, D. C.

Those in the construction section are:

Walter L. Couse, president, Associated General Contractors of America, Walter L. Couse & Co., Detroit; Glen W. Maxon, president-elect, AGC, Maxon Construction Co., Inc., Dayton, Ohio; A. S. Horner (highway contractor), president, A. S. Horner Construction Co., Denver; H. C. Turner, Jr. (building contractor), president, Turner Construction Co., New York; C. W. Moseley (electrical contractor), vice president, R. H. Bouligny, Inc., Charlotte, N. C.; Wray M. Scott, president, Heating, Piping and Air Conditioning Contractors Association, president, Wray M. Scott Co., Inc., Omaha; Thomas P. Coogan, president, National Association of Home Builders, president, Thomas P. Coogan Construction Co., Miami, Fla.; and J. E. Merrion (home builder), president, J. E. Merrion Construction Co., Chicago.

Among others in sections for supply, planning and financing counsel are: D. S. MacBride, president, Hercules Cement Corp., Philadelphia, and J. M. Straub, president, Fort Pitt Bridge Co., Pittsburgh.

Three states plan higher gas taxes

Four states are discussing higher taxes for motor vehicle users, and fuller use of road funds for highway construction. (ENR Oct. 5, p. 120)

Three states are planning higher motor vehicle taxes, against a background of rising governmental costs, and in the state of Georgia road fund diversion is under attack by the state Highway Board.

In Illinois a proposal from Gov. Stevenson is before the legislature asking for a five-cent gas tax, a boost of two cents a gallon. (ENR July 27, 1950, p. 96)

Backers of the new gas tax plan (which was defeated in 1949) say the new tax would bring in $85,000,000 a year. The 1949 proposal was passed by the legislature but defeated at the polls. Aim of the higher tax is to match federal road funds.

To further bolster state road finances, Stevenson called for higher license fees for trucks, busses, and trailers on a ton-mile basis in "common fairness" to light car owners who damage roads little. Severer penalties for overweight truck infractions were also proposed.

In Michigan an identical tax proposal is before the legislature to raise gas taxes two cents a gallon to five cents. The bill is expected to raise tax returns from $30,000,000 to $32,000,000 yearly. Rep. Emil A. Peltz, also included in the measure a new distribution formula and said changes in the weight tax on trucks would come later.

At Omaha, legislators are considering similar solutions to the state's road problems. In this state a one cent tax rise which was voted in 1949 and thrown out by a referendum is up again for consideration, to bring the gas tax to six cents a gallon.

The tax rise will probably be opposed by the Nebraska Farm Bureau federation. Charles Marshall, president of the organization, says that as matters stand now he believes his organization would resist further tax increases in Omaha. The Farm Bureau was one of the three large farm groups that fought the tax through the referendum.

Higher penalties for trucks violating weight loads are also being readied in the state legislature. The present maximum tax is $25, but many violations get off for only $15 fine.

Georgia, meanwhile, is fighting road fund diversion.

The Highway Board asserts that Georgia's highways are simply being worn away faster than they can be rebuilt with present funds.

According to one board member, Georgia has been trying to get along on $30,000,000 a year for roads while South Carolina has a $75,000,000 bond issue, North Carolina a $200,000,000 bond issue, Tennessee $66,000,000 and Florida $142,000,000 to spend.

In Georgia nearly one third of highway user taxes are diverted to other purposes of government.

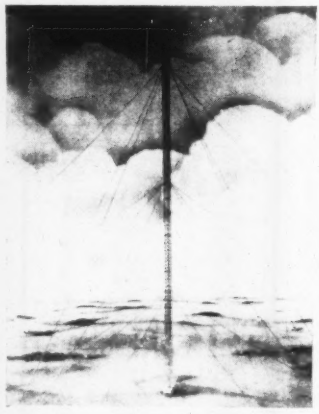
Closer police protection given western power site

To reduce possible sabotage, public visits to dams and power projects in the Rocky Mountain and Western Plains areas have been restricted by the Bureau of Reclamation.

Avery A. Batson, director of the Bureau of Reclamation's Region, says it "is not overly alarmed" at the danger of sabotage, and that supervised visits to nonvital parts of projects will be permitted.

Gone for the duration, however, are casual trips over the projects which were enjoyed in the past.

During normal times, the Bureau of Reclamation has encouraged visits by the public to all projects.



SECOND HIGHEST STRUCTURE—The U. S. Air Force Electronics Center, Griffiss AFB, will use this guyed, steel shaft at Forestport, N. Y., for experimental and development work in long-range navigation. The structure, completed recently, is a uniform, triangular cross-section more than 1,200 ft high and said to approach the height of the Empire State Building. Design (artist's conception shown) is by Watson Laboratories, Eatontown, N. J., and erection by John F. Beasley Construction Co., Muskogee, Okla., and the Wickes Engineering Co., Camden, N. J.

New England steel mill gets N.R.S.B. certification

A long stride toward the building of a large steel mill in New England was taken Jan 11. The National Resources Security Board has awarded a certificate of necessity to the New England Steel Development Corp., a subsidiary of the New England Council, authorizing the construction of a plant with an estimated capacity of 1 million ingot tons of steel per year and an estimated construction cost (including equipment) $250 million with proposed tidewater location in the New London-Waterford (Conn) district.

The project appears to hinge upon establishing legal authority to exercise the right of eminent domain in acquiring the necessary land for the mill and related housing facilities in the area of construction. It may be that the Conn. legislature will be required to meet this situation by a special act.

Clifford S. Strike, president of the development corp. and head of F. H. McGraw Co., was quoted last week as saying that financing is assured, and that construction is expected to begin by late spring or early summer.

The RFC has offered to cooperate 100 percent in financing the project. Private capital may participate so fully that government money may not be required, but this remains to be determined. It is understood that construction costs could be written off in 5 years instead of 20 for tax purposes.

Construction frozen

(*Continued from page 23*)

Committee urged that the regulation be issued the same day, to take effect that night. The members wanted the freeze to go into effect at once, before any rumors could get started.

• **Victory for the Industry**—Setting up of the Advisory Committee is a victory both for the construction industry and for its representatives in the defense agencies. All through World War II, construction people fought unsuccessfully to have an advisory committee to talk for them as other groups were doing for their industries.

This time, Follin insisted on a group to represent construction. If his plan had not received the backing of Frank R. Creedon, NPA assistant administrator in charge of the Construction and Facilities Bureau, as well as that of William R. Harrison, former NPA administrator and now head of the new Defense Production Administration, NPA would now be looking for a new director of its Construction Controls Division.

Seek $4-billion for nonmilitary building as record budget goes to congress

President Truman's message calls for construction spending far over any non-war year, with military construction still not estimated

By Vincent B. Smith
Washington Staff

Projected federal construction spending for fiscal 1952 exceeds—by a big margin—the total for any previous non-war year. President Truman this week spelled out for Congress a construction budget that entails the outlay of nearly $4 billion of federal cash for non-military works alone in the 12 months from next July 1 to June 30, 1952.

Armed-force requirements for fiscal '52 have not yet jelled: Rapid changes in Korea and elsewhere around the globe keep all military calculations fluid. But Truman promised to send a '52 military budget to Congress in the spring.

Meanwhile—to guide Congress in writing tax bills—the President's Jan. 15 budget included a round-figure expenditures estimate for the armed services of $40 billion during Fiscal '52. That sum accounts for more than half of the estimated total spending for the year by the federal government—$71.6 billion. With other security expenditures included—$1.4 billion for military programs outside the Defense Department and $7.5 billion for international preparedness—the total defense bill for 1952 goes up to nearly $50 billion, almost 70% of the overall budget.

• **Army to spend $40-billion**—Of the expected $40 billion to be spent by the armed services, construction will probably get upwards of $2 billion. True, the nation has most of what it needs in the way of camps, airbases, navy yards and explosives plants, except for A-bomb and H-bomb materials; but even so the mounting defense effort will require military construction equal to the later years of War II. In fiscal '44, after camp building and similar indispensable work had been completed, we spent $1.3 billion for military construction. For the preceding year, fiscal '43, the figure was $4.8 billion.

With military public works included, the federal cash outlay for construction in fiscal '52 may well top $5.5 billion. Only in two of the calendar years of War II has the federal rate of construction spending been higher. In calendar year 1942, the federal government put $9.8 billion into construction work in calendar year 1943, $5.9 billion.

Defense needs have set the pattern of non-military construction expenditures for fiscal 1952. Under the figures in the accompanying tables lies a sharp change in emphasis. As Truman pointed out in his message, construction programs for 1952 aim first at making the greatest possible immediate contribution to national security, even at the expense of postponing desirable long-range developments.

• **Long term needs**—Other long-term needs of the nation are not overlooked. Along with expansion of construction to support the immediate defense effort, the budget attempts also to allot sufficient cash for long-range developments to maintain steady growth of national strength. Paralleling these objectives, and often pointing in the same direction, is a third purpose—to supply just enough money to less essential, continuing projects to keep them operating and thus save the government the considerable expense of shut-downs and later resumptions.

Thus, the broad policy for civil public works in 1952 allows only a minimum rate of progress consistent with efficient use of funds. New projects are proposed in the budget only for defense or essential civilian needs. Among them are seven new power projects—six hydro and one steam—in areas where shortages exist or impend.

On the same basis of essentiality, highways are the only civil works item in the grant-and-loan category for which federal commitments will not be cut in 1952.

• **AEC biggest**—Shift of emphasis stands out clearly in the budgeted figures for development of natural resources. In this field, the Atomic Energy Commission will make by far the largest investment of any government agency, putting $720 million into construction out of its total 1952 expenditure of nearly $1.3 billion.

Even greater will be the combined construction expenditure of the Army Engineers, the Reclamation Bureau and TVA, totaling more than $950 million for all three. Most of that money—$672.5 million to be exact—will go into power projects or projects with important power features.

But that is not all the power money in the construction budget. In addition, the three regional power administrations of the Interior Department—Bonneville, Southwestern and South-

(Continued on page 25)

Expenditures for Civil Public Works
(Fiscal years, in Millions)

PROGRAM	EXPENDITURES 1950 ACTUAL	1951 ESTIMATE	1952 ESTIMATE
MAJOR PROGRAMS:			
Veterans' Hospitals	$160.4	$213.2	$155.2
Bureau of Public Roads	461.8	454.6	456.9
Bureau of Reclamation	272.0	314.4	230.5
Corps of Engineers	539.7	565.2	543.7
Atomic Energy Commission	239.5	377.0	720.4
Housing and Home Finance Agency			
(Gross)	27.8	365.5	269.2
Loan Repayments	4.5	165.7	285.4
Tennessee Valley Authority	51.4	243.7	265.7
General Services Administration	15.3	70.7	182.6
OTHER PROGRAMS:			
Federal Security Agency	18.3	64.5	139.3
Department of State	4.0	13.1	86.3
Reconstruction Finance Corporation			
(Gross)	.8	25.0	95.0
Loan Repayments	6.1	4.5	5.1
Commodity Credit Corporation	95.1	53.3	25.5
Bonneville Power Administration	28.4	49.9	49.0
Federal Civil Defense			
Administration	.....	.....	107.8
Defense Housing and Community facilities	.....	.....	100.0
Civil Aeronautics Administration	58.4	66.9	80.1
Other	90.5	159.0	136.1
Total, Civil Public Works	2,052.8	2,856.8	3,352.8

$4 billion for non-military building

(*Continued from page 25*)

eastern—are to spend $56 million, and the International Boundary Water Commission is to invest $15 million, principally in Falcon Dam on the Rio Grande.

• **Seven projects**—In all, construction for power is to get $743.5 million during fiscal '52. Nearly 10% of this cash ($68.6 million) is to pay first-year construction expenditures in starting the seven proposed new projects: Three in the Northwest—Hell's Canyon and Ice Harbor on the Snake and The Dalles on the Columbia, one on the Missouri—Gavins Point, two in the TVA area—Old Hickory on the Cumberland and a new steam plant, and, last but far from least, the St. Lawrence seaway and power project.

Truman urges the St. Lawrence development more strongly than ever—not only to produce power but also to give Great Lakes ore boats access to Labrador Iron. Last year he put $15 million in the 1951 budget for the project. This time he asks $20 million in 1952, as a starter on the U.S. share of the $600-million International Rapids section.

No similar request was made for construction money to start the more readily exploitable power at Niagara Falls. Truman tactfully asked only for a $2,000,000 appropriation, of which $1,600,000 would be expended during fiscal '52 by the Corps of Engineers, for engineering and economic investigations. Congress still has to authorize the development—creating 1,132,000 kw. of additional firm power on the U.S. side of the river—by the federal government, by New York state or by private interests (Niagara Hudson). The President stressed the project as urgently needed.

• **St. Lawrence project**—Regarding the St. Lawrence, Truman showed no such hesitancy. His mind is made up that only the U.S. and Canada should—or rightly could—construct the $800-million dual-purpose project.

Likewise on Hell's Canyon he showed no diffidence about recommending money to start a project that is not yet authorized. The $330 million development—a 742-ft. dam and 900,000-kw powerplant—would have had the green light from Congress before this if Reclamation had not insisted on tying to it the Mountain Home irrigation project costing $1,000 an acre to put under ditch.

In all, the seven new projects, costing $1.5 billion to complete, will provide 3,550,000 kw. of installed capacity, with additional generating units included in the 1952 construction budget for six other projects already under way. The total increase in capacity will amount to more than 3,900,000 kw., raising the overall capacity in power plants of the Army Engineers, Reclamation and TVA to 20,000,000 kw.

• **River basin project**—Despite increases planned for power projects, river basin development as a whole shows a small decline of $67 million from the 1951 estimated expenditure of $1,179 million. This saving is possible by a cut of nearly $85 million in the reclamation program, from $314 million in 1951 to $230 million in 1952. The cut seems lopsided, in comparison with the reduction of less than $22 million for the Army Engineers, until the two programs are analyzed.

First of all, Army Engineer projects will furnish three-fourths of the 4,000,000-kw. capacity in projects now under construction by the two agencies. Likewise, the Corps of Engineers will be responsible for 2,300,000 kw. of the additional capacity in the seven new projects requested for 1952. On another point, irrigation works more often can be utilized to the extent they have been completed, even if construction is halted or slowed down; the same is not true of flood control works, which usually are not effective until they are finished.

• **Power projects ahead**—Most of the money will go into power projects or projects with important power features. New obligational authority requested for such projects in 1952 amounts to $672.5 million.

But that is not all the power money in the construction budget. In addition, the three regional power administrations of the Interior Department—Bonneville, Southwestern and Southeastern—are to get $56 million of spending authority, and the International Boundary and Water Commission is scheduled to receive $15 million for Falcon Dam on the Rio Grande.

• **Irrigation down**—Some reductions on irrigation are to be made in the Columbia and Missouri basins. The Central Valley project also is to be held down.

Highway construction is to move ahead at an undiminished rate, with full recognition of the fact that the main roads must be improved to carry defense traffic. For that purpose, the Bureau of Public Roads is instructed to put as much as possible of the $470 million expenditure for 1952 into the 40,000-mile interstate system and its connecting urban highways inside the cities.

Direct federal construction of main highway links across national forest lands also will receive a larger allowance of $20 million. Forest roads and trails are due to get more—$16.6 million—as an aid to increasing the timber cut.

• **Access road funds**—Access roads to military posts and defense plants will be financed, so far as possible, by diversion of funds from less urgent roads. Construction is being started in the current fiscal year on a number of these roads. The President says the need will increase.

• **Business loans rise**—Business loans by the government under existing and proposed legislation are estimated to total $790 million in 1952. Probably one-fourth of this, or nearly $200 million, would be invested in construction of new plant buildings and other structures.

Other projected federal construction expenditures for fiscal 1952 are these:

Federal Expenditures for International Public Works and for Semipublic Programs (Fiscal years, in Millions)

PROGRAM	1950 Actual	1951 Est.	1952 Est.
Loan to United Nations	$26.2	$22.4	$4.9
Inter-American Highway	1.7	3.1	4.7
Rural Electrification Administration, Loans, Gross	286.7	303.2	260.0
Grants for Hospital Construction (1)	47.3	112.0	95.2
National Heart and Cancer Institutes, Aids for Research Const. (1) (2)	3.2	4.4	5.5
Howard University, Construction	.6	2.5	3.5
Aids to Medical Education, Grants (2)	.....	.....	2.0
Loans to Educational Institutions	.....	1.0	36.0
Total	365.7	448.6	411.8

(1) Includes semipublic construction only. Balance of construction amount is shown in Public Works Table.

(2) Includes only that part of the appropriation account used for construction.

airports, $52 million; Voice of America, $73 million; Agricultural storage facilities, $25 million; Panama Canal Housing, $11 million; InterAmerican highway, 4 million; loans to medical schools for defense-related housing, $36 million; loans for farm housing $23 million.

Spending in Alaska by the office of territories will include $25 million for roads and $10 million for public works, $6 million for the Eklutna Power Project, and $1 million for the Alaska Railroad to complete the Eielson Branch.

The existing Federal Loan program for advance planning of local public works will be allowed to expire Oct. 13, 1951. Planning for both defense housing and supplemental community facilities will continue in the Housing and Home Finance Agency under legislation now before Congress.

• **Assembly of basic data**—Assembly and preparation of basic data—topographic, geodetic, geologic, hydrologic and climatologic—the budget requests a 1952 appropriation of $40 million, an increase of $5.5 million over 1951 expenditures. Preliminary surveys, including river basin surveys, will get $14.5 million. But, because of the cutback on starts for nondefense construction, the money for detailed plans is to be reduced from $25 million in fiscal '51 to $10 million in fiscal '52.

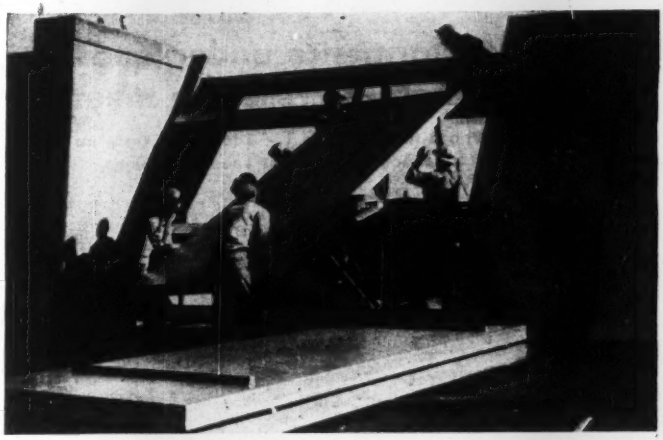
Before the current fiscal year ends, President Truman will spend an appropriation request to Congress for $10 million to defray the operations of the National Science Foundation.

Point 4 technical assistance is to get about $95 million for the year. Also, the lending authority of the Export-Import Bank should be increased by $1 billion, the President says. Its loans to overseas projects are expected to amount to $500 million during '52, twice the volume of the current year.

REA loan programs for electrification and telephone service have been cut back to a total of $260 million for fiscal '52, as compared with $305 million in 1951. Both programs use large quantities of critical materials.

Some federally-financed building programs suffer a cutback in the 1952 budget. Veterans hospitals go down to $155 million. Expenditures in payment of grants for local hospital construction will be off a little to $116 million.

But other federal building programs will be substantial. The Civil Defense Administration expects to spend $107 million in matching grants for bomb shelters and direct federal construction of control centers. Likewise, most of the expected $95 million in RFC loans to public bodies will be construction of underground structures that could be shelters.



EMERGENCY FLOODWALL PANELS—First of the panels designed to close 54 street, railroad and other openings in the floodwall is lifted into place in Louisville, Ky. In time of high water, the aluminum panels, weighing about 300 lbs apiece, are set upright—supported by steel and aluminum trusses. Workers of the Globe Engineering and Erection Co., New Albany, Ind., closed this 24-ft opening in an hour, which is considered an average time.

Lion's share goes to power work

Of $149.4-million requested for Corps of Engineers rivers and harbors construction in fiscal '52, 62% will go to five hydro-electric projects: McNary, Chief Joseph and the Dalles Dams on the Columbia; Jim Woodruff on the Apalachicola River in Florida; and Old Hickory. McNary, where first power now is expected to go on the line in Dec., 1953, will get $42.9 million during the coming fiscal year, under the Corps estimates.

About half of the Corps' $312.7 million proposed flood-control construction fund is being requested for eight power projects: Bull Shoals in Missouri and Arkansas; Clark Hill, Ga., and South Carolina; Albeni Falls, Idaho; Buggs Island, Va.; Garrison, N. D.; Detroit, Ore.; Lookout Point, Ore.; and Fort Randall, S. D. Largest project appropriations are in the Missouri Basin where Garrison is allotted $37 million and Fort Randall, $34.7 million.

About 73% of Reclamation's $224 million construction fund is planned for five projects which include power development: Hungry Horse, $23 million; Columbia Basin, including installation of final power units at Grand Coulee Dam, $27.9 million; Colorado-Big Thompson, $19.3 million; Central Valley, $38 million; and Missouri River Basin, $59 million, including more than $18.7 million for transmission line construction. A 230-kv transmission line between Central Valley and Bonneville's power system is included in the Central Valley Program for fiscal '52.

TVA Plans—TVA plans to spend more than $266 million for construction in fiscal '52, with all but $25 million to be supplied by new appropriations. Construction work on three dams, 10 hydro-generating units, and a total of 22 steam units at five plants are included in this program.

Total appropriation sought by TVA for the coming year is $248,568,000 compared with current year's appropriations of only $131,214,000.

Military jobs given over to district engineers

Fort Worth and Little Rock Engineer Districts have been given responsibilities for military construction in their areas, according to Colonel Louis W. Prentiss, Southwestern Division Engineer.

Military construction for the northern part of Texas except the Red River Basin and Panhandle areas will be under Colonel Delbert B. Freeman, District Engineer at Fort Worth. Tulsa District will be under Lt. Col. Edward G. Herb who will continue to have responsibility for the Red River Basin and Panhandle, as well as the entire state of Oklahoma.

Colonel Charles H. McNutt, district engineer at Albuquerque will have jurisdiction in the extreme western portion of Texas south of New Mexico, and the state of New Mexico.

Colonel Hans W. Holmer, district engineer, Little Rock, has responsibility in Arkansas and the northern half of Louisiana.

Test road performance under loads reported at highway research meeting

Highway Research Board makes plans for additional tests on pavements—Frost action on roads reviewed at special sessions

High spot of the 30th annual meeting of the Highway Research Board in Washington Jan. 9-12 was a preliminary report of the effect of four different truck loadings on a concrete pavement in Maryland that the board has had under study since last June. Operation of the test trucks over the pavement was completed on Dec. 23. Before the meeting was over, plans for additional tests in other parts of the country, on both concrete and bituminous pavements, were taking shape.

A second feature of the meeting was a symposium on frost action on highways, 38 papers were reviewed.

In opening the session given over to reports on the Maryland test road, Roy W. Crum, director of the Highway Research Board, characterized the test as a striking demonstration of the interrelation between sub-grade materials, pavement and traffic. He also called attention to the fact that much work remains to be done before all the results can be properly evaluated.

This important undertaking, which ultimately will cost $245,000, could not have been carried out, Mr. Crum said, had it not been for the cooperation of the 12 highway departments that supplied $150,000 in cash, the Public Roads Administration, which supplied the field staff, the automotive manufacturers who supplied the trucks, the oil companies that supplied the fuel, the Department of Defense, which took air photos, and the National Research Council.

• **Condition of the test pavement**—Details of the condition of the test pavement at the completion of the operation of the test trucks were given by A. Laragin, project engineer. The test road is about 45 miles south of Washington at a point on state route 301 where traffic could be diverted conveniently to a parallel road to release 1.1 miles of pavement for test purposes. (See ENR Nov. 2, 1950, p. 25 and Nov. 9, p. 30).

The pavement used is concrete, 24 ft wide and has a cross section of 9-7-9 in. It was divided for the tests into a south section on which two trucks with 18,000 lb on a single rear axle were operated on the west lane and two trucks with 22,400 lb on the single rear axle were operated on the east lane. Over the north section, two trucks with 32,000 lb on tandem axles operated on the west lane and two trucks with 44,800 lb on tandem axles operated on the section's east lane.

The trucks were operated continuously, 24 hours a day, seven days a week (with time out for fueling, repairs and meals) from June 12 to Dec. 23, except in the case of the section under 44,800-lb loading, where truck operation was discontinued Oct. 13 because of severe pavement damage.

After 238,000 truck passes, 72% of the slabs in the 18,000-lb section showed no structural damage due to the test loading whereas only 36% of the slabs in the parallel lane remained undamaged by the same number of repetitions of the 22,400-lb load.

On the north test lanes only 92,000 truck passes had been run when it was necessary to stop the test in the parallel 44,800-lb lane. At that time only 4% of the slabs remained undamaged. For the same number of passes in the 32,000-lb parallel lane 73% of the slabs showed no structural damage due to the test.

Strain and deflection measurements were made on the pavement during the test period and they are being continued. Details of this work were given at the meeting by Earl C. Sutherland and Harry D. Cashell, engineers in charge of instrumentation and tests.

Fred Burggraf, associate director of the Highway Research Board and director of the Maryland test-road project, reported that plans are underway for making similar studies on a bituminous pavement in one of the Southeastern states and in a Western state—and on another concrete pavement in the Midwest.

Concerning the Maryland work, Burggraf stated that a trench is to be dug along each edge of the pavement to get a complete check on the type of soil under the pavement. Cores also will be cut through the pavement to check its thickness and strength and to get additional soil data.

• **Frost action on roads**—Frost damage to highways and means for preventing it was the subject of a symposium arranged by the committee on Frost Heave and Frost Action in Soils, under the chairmanship of K. B. Woods of Purdue University. Papers considered covered climate and distribution of soils affected by frost, soil temperatures and thermal properties of soils, soil moisture and moisture movements, frost action and spring break-up, and remedies for frost action.

At the end of the symposium, needed research into frost action and related phenomena were discussed by Frank Olmstead, soils engineer of the Bureau of Public Roads and A. W. Johnson, soils engineer of the Highway Research Board. Johnson said that a review of published literature by the staff of the Highway Research Board has been completed and will be ready for publication by the board this year. It will help materially in deciding what subjects call for further study.

He said there is need of a better understanding of the extent and nature of the damage caused by frost action, for more precise information on the processes of freezing and thawing, for development of means for predicting the load carrying capacity of pavements and their foundations and protecting them from damage during the frost-melting period.

Olmstead said there is urgent need for a correlation of research now in progress on frost action.

Numerous papers on other aspects of soils as they relate to the work of highway engineers were presented at other sessions.

• **Honors for research work**—Highway Research Board Awards were made during the meeting to Roy E. Jorgensen, deputy commissioner and chief engineer of the Connecticut Highway Department and Robert G. Mitchell, assistant highway engineer of that department, for their joint paper "Accident Analysis for Program Planning," which was presented at the 1949 meeting.

Distinguished Service Awards also were made to A. T. Goldbeck, director of the Bureau of Engineering of the National Crushed Stone Association, and F. V. Reagel, engineer of materials and tests, Missouri Highway Department, for their long service to the Board and their many contributions to its research work.

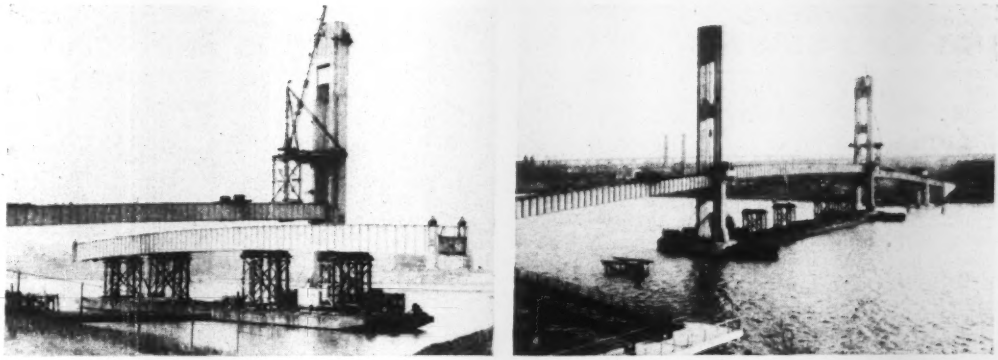
Further details of the meeting will be given in a subsequent issue.

City faces $100 fines

After repeated warning to the city of Mt. Vernon, Ill. the Illinois State Department has instructed the chairman of the Health Department that he can fine the city $100 a day for failure to clear a polluted stream.

Farmers along Casey Fork Creek complained that the polluted water was killing livestock and damaging crops. Ivan A. Elliott, state attorney-general, ruled that a fine could be levied.

Gibson City, Ill., faced a similar fine a few months ago for failure to install a sanitary plant after voters had three times rejected approval of a bond issue to finance construction of the plant. The fine was not assessed.



RECORD LENGTH GIRDER LIFT SPAN was erected over the Harlem River in New York City Jan. 6. Plate-girder structure 10 ft deep was floated from Ward's Island Shore, lifted to span 312-ft 2½ in. between tower bearings. The $2,000,000 pedestrian crossing (ENR Feb. 16, p. 42) is a Triborough Bridge and Tunnel Authority job. American Bridge Co. fabricated and erected the steel; Ammann & Whitney, designers, supervised construction (Photos: Ammann & Whitney, Wide World).

N. Y. plans new tube, elevated highway

A new vehicular tunnel under the Hudson River and a $22,000,000 elevated section of a new express highway in the city's Bronx County topped eastern construction news last week.

At an annual meeting of the directors of the Port of New York Authority (at which he was re-elected chairman) Howard S. Cullman said that authority engineers are now working on plans for a third tube for the Lincoln Tunnel, whose tubes connect mid-town Manhattan with Weehawken, N. J.

It was learned that present thinking now contemplates installation of the third 31-ft dia vehicular tube south of the present South Tunnel, with entrances into broad plazas already existing on both sides of the river. No cost figures or engineering details were immediately available, but the present tunnels stretch about 8,000 ft, portal-to-portal, and cost about $80,000,000 to complete. Ventilation facilities will have to be installed for the new tunnel.

The first (south) of the existing Lincoln Tunnel tubes was opened to traffic in February, 1937, and although the North tube was driven through at about the same time, it was not put into service until 1945—when traffic increases and waning materials shortages dictated the move. Completion of the Port Authority's new bus terminal (ENR Dec. 14, p. 32) on Dec. 15, 1950, channeled additional traffic through the tunnel.

• **Elevated highway**—The two-mile elevated highway would be built by New York's Triborough Bridge and Tunnel Authority, to provide a crossing-free link between the Bronx River Parkway, leading to the north, and the Maj. Deegan Expressway, which will carry traffic through congested areas of The Bronx (ENR Oct. 6, 1949, p. 20).

The elevated portion will be built over Bruckner Boulevard, and will handle three lanes of traffic in each direction. It is planned to be an all-steel structure supporting a cantilevered highway deck on two rows of steel columns. The whole improvement will be added to a new $18,000,000 extension of the Bronx River Parkway which now ends at the north end of Bruckner Boulevard.

Reinhold official choice to head A.R.B.A. in 1951

Lt. Gen. Eugene Reybold, executive vice-president of the American Road Builders' Association announces that Paul B. Reinhold, president of the Atlas Equipment Corp. of Pittsburgh, has been designated official nominee for the 1951 presidency.

Balloting on the nomination of Mr. Reinhold to succeed Colonel E. R. Needles, New York consulting engineer will take place between now and the three-day annual meeting of the association which opens in Milwaukee, March 12.

Other nominees, for vice-president: Charles M. Noble, chief engineer, New Jersey Turnpike Authority; Charles W. Smith, president of Smith Engineering & Construction Co., Pensacola, Fla.; W. A. Roberts, executive vice-president of Allis-Chalmers Mfg. Co., Milwaukee, Wis.; and A. A. Diefendorf, head of the Department of Civil Engineering, U. of Utah.

For treasurer: Jennings Randolph, assistant to president of Capital Airlines, Inc., Washington, D. C.

TVA announces go-ahead on two new steam plants

Tennessee Valley Authority announced in Knoxville that construction will get underway immediately on two giant new steam plants. The announcement followed signing by President Truman of a supplemental appropriation bill containing funds to begin the new construction.

The new projects are:

Paducah plant, to be located 15 mi south of Paducah, Ky., on the Ohio River, will supply half of the 850,000-kw load at the new Atomic Energy Commisison uranium separation plant to be built near Paducah (ENR Dec. 21, p. 24).

• **Identical plants**—Swan's Pond plant, two miles from Kingston, Tenn., is being built to meet lead growth on the eastern end of TVA's system.

The new plants, described as almost identical, will each have four units of 150,000 kw capability each.

Total cost of the Paducah plant is estimated at $88.5 million, while Swan's Pond will cost $85 million.

Bush awarded Fritz Medal for scientific work

Dr. Vannevar Bush, president of Carnegie Institution, Washington, has been awarded the John Fritz Medal for "outstanding scientific contributions to his country and to his fellow men."

The award will be given at the general winter meeting of the American Institute of Electrical Engineers to be held in Washington from Jan. 22 to 26.

Other groups joining in awarding Dr. Bush this honor are the American Society of Civil Engineers, the AIMME and the ASME.

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 72, went to press.)

Electric Power Plant—Ebasco Services, Inc., New York, will design and construct a $73,000,000 electric power plant, near Joppa, Ill., for Electric Energy, Inc., St. Louis. The project will provide part of the power for the Atomic Energy Commission plant at Paducah, Ky.

Housing—New Orleans Housing Authority, New Orleans, La., will take bids for the second time on three housing projects estimated to cost $15,245,000 each. Bids for the St. Thomas Housing Project will be opened Jan. 24. Andrey & Feitel, August Perez & Associates, New Orleans, architects; for the St. Bernard Housing Project, Jan. 26, Nolan, Norman & Nolan & Associates, New Orleans, architects; and for the Florida Avenue Project, Jan. 30, Benson, Olschner, Freret & Wolf, New Orleans, architects.

Steel Mill—A $42,000,000 steel mill expansion at Ecorse, Mich., for Great Lakes Steel Co., Ecorse, will be designed and built by Freyn Engineering Co., Chicago.

Mental Hospital—Building Department, State of Michigan, A. N. Langius, director, Lansing, plans a $9,300,000 mental hospital at Northville, Mich. This is one of several hospital projects, which will be financed from $65,000,000 approved bond issue.

Pulp Mill—Canadian Forest Products, Ltd., Vancouver, B. C., plans expanding Howe Sound Pulp Mill. Estimated cost is $10,000,000.

Pipe Line—Platte Pipe Line Co., Casper, Wyo., awarded $8,500,000 contracts for 1,072 miles 20-in. crude oil pipe line from Wyoming to Wood River-St. Louis area to R. H. Fulton, Lubbock, Tex., Bishop & Lock Construction Co., Dallas, Ramsey Brothers, Houston, and O. R. Burden Construction Co., Tulsa, Okla. The total cost of the project will be $60,000,000.

Housing—W. D. Jameson Construction Co., Memphis, Tenn., will build housing project in West Memphis, Ark., to cost $6,000,000, for the Memphis View Co-Operative Homes, Inc., Memphis. Cy. Bond, Marion, is engineer. Eanes & Sanford, Memphis, are architects.

Aluminum Plants—Aluminum Company of America, is taking bids at local plants for a $8,500,000 production potline, power house and utilities at Port Neches, Tex. and for a similar project to cost about $7,300,000 at Port Lavaca, Tex.

Transmission Lines—$5,959,000 transmission line is planned by the East River Electric Power Co-Operative, Sioux Falls, in eastern South Dakota. Buell & Winters, Sioux City, Ia. are engineers.

Apartments—Crestwood Lake Corp., Yonkers, N. Y. will construct by own forces an apartment at Yonkers, at about $6,000,000. Samuel Paul, Jamaica, N. Y., is architect.

Power Plant—City of Lansing, Mich., plans a $4,500,000 addition to Moores Park Power Plant, on Grand River. Burns & Roe, New York, are engineers. Preliminary studies are being made for the project.

Camps—Department of the Army, Washington, D. C., plans following projects in State of Washington: camp at Yakima Firing Center, $5,340,000; mobilization expansion at Fort Lewis, $4,000,000 and quarters and barracks at Tacoma, $1,407,000.

City-County Office and Bomb Shelter—City-County Authority, Detroit, has commissioned Harley, Ellington & Day, Inc., Detroit architect who drew original plans to redesign proposed City-County Building in Detroit, to include a bomb shelter. Cost is expected to be about $16,000,000, adding $700,000.

Housing—William Magazine, Washington, D. C. plans a $6,000,000 apartment, with playgrounds and off-street parking in Cleveland. Standard Construction Co., Washington, is engineer-architect.

Generating Plant—Sargent & Lundry, Chicago, will build a $3,200,000 generating plant at Hoot Lake, Fergus Falls, Minn., for the Otter Tail Power Co., Fergus Falls.

Factory Expansion—Austin Company, Cleveland, will build factory additions at Elyria, Ohio, for Bendix-Westinghouse Automotive Air Brake Co., estimated at $2,000,000.

Apartment—Nostrand Gardens Co-Operative, Inc., Brooklyn, N. Y., will construct a $3,000,000, apartment in Brooklyn, by own forces. Morris Rothstein & Sons, Brooklyn, are architects.

Housing—Housing Authority of Bay City, Mich. plans housing project at about $4,500,000.

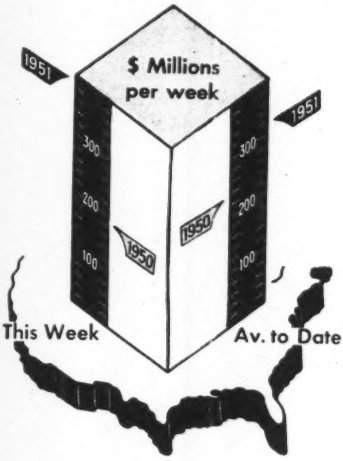
COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100		1913	1926	1949
Constr. Cost	Jan. '51	530.73	255.12	111.26
Bldg. Cost	Jan. '51	392.06	211.93	111.45
Volume	Dec. '50	759	308	219

Activity This Week

As reported to ENR (in millions of dollars)



Amount of contracts let

	Week of Jan. 18 '51	Cumulative 3 wks 1951	1950	% chge
Federal	$98.9	$262.1	$255.9	+2
State & Mun.	50.5	252.3	178.1	+42
Total Public	$149.5	$514.4	$434.0	+19
Total Private	242.1	447.2	265.0	+69
U. S. Total	**$391.6**	**$961.6**	**$699.1**	**+38**

Contracts by type of work

	This Week	Cumulative 3 wks 1951	1950	% chge
Waterworks	$1.7	$9.4	$22.3	−58
Sewerage	6.9	22.7	10.1	+125
Bridges	3.7	23.3	20.6	+13
Highways	12.1	49.1	54.4	−10
Earthwork, Waterways	2.5	9.9	22.7	−56
Buildings:				
Public	107.4	302.3	260.3	+17
Housg., pub.	9.2	70.4	20.1	+250
Housg., priv.	53.3	86.3	125.9	−31
Commercial	20.6	67.8	61.6	+10
Industrial	141.4	254.5	49.0	+419
Unclassified	32.8	64.9	52.0	+25

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Cumulative 3 wks 1951	1950	% chge
Corporate Securities	....	$73.0	....
State and Municipal:			
Excl. housing	....	77.5	....
Housing	....	15.3	....
Total Non-Federal	....	165.8	....
FEDERAL	2,602 5	....	....
TOTAL CAPITAL	....	$165.8	....

TURNS ON THE HEAT—Another snow disposal machine, shown here being demonstrated in Los Angeles, Calif., consists of a large tank or hopper mounted on a motor truck. Snow shoveled, or dumped into it by a conveyor belt or blower, is melted by 33 burners fueled by butane gas. The resultant water leaves through a hose line at the bottom of the tank, draining into the gutter. The machine melts 125 cu ft of snow in 2¼ minutes. It is the invention of A. J. Cayas, Glendale, Calif. (Wide World photo)

Florida readies drive for barge canal

Civic groups in Florida are sharpening their shovels in a new effort to dig a great canal across the northern portion of the peninsula. Imminent war provides the backdrop for their efforts.

During World War II many tankers, a large portion of the shipping through the narrow Florida straits were torpedoed by the enemy. One of the civic arguments advanced for the completion of the intra-coastal waterway from Corpus Christi, Tex., to Trenton, N. J. is the avoidance of this hazard under any new war conditions.

The big ditch for the barge canal was started in 1935, but stopped a year later when the first appropriation of funds was exhausted. Approved in World War II as a defense measure, the job was estimated at $44,000,000.

No current estimate of cost has been made by the Corps of Engineers, but the Jacksonville Chamber of Commerce makes a current estimate of $80,000,000.

Edward H. Hobbs, member of the chamber's waterway staff claims the project is economically feasible, and justified, dollar for dollar, through savings in oil tankers which would otherwise be sunk in time of war. The barge canal would also assure the Atlantic Coast area a sure supply of petroleum, he says.

To support the agitation for the job, the Jacksonville Chamber of Commerce is naming a committee with the sole purpose of promoting the canal.

In charge of committee activities are James H. Coppedge, marine contractor, and James C. Merrill, president of Merrill-Stevens Dry Dock and Repair Co.

A channel depth of 12 ft, and bottom width of 150 ft., with locks 75 ft wide and 600 ft long is proposed. It would connect the St. John's River and its tributary Oklawaha River, by a 32-mi canal, with the Withlacoochee River flowing into the Gulf of Mexico about 75 miles north of Tampa.

Three locks on the east slope and two on the west would provide total lifts of 55 feet to the summit pool.

The Oklawaha River and Silver Springs Run enter the pool of the second lock and dam west of the St. John's River and the combined natural discharge of these streams is sufficient to provide all the lockage water necessary to the waterway.

The summit pool extending about 28 mi between Silver Springs and Dunnellon would get its supply of water from the Oklawaha. The locks are so designed that the water surface in the section can be maintained between elevations 42 and 55, which is the range through which the adjacent area has fluctuated in the past. By maintaining the summit pool at the natural ground water level at all times, the ground-water supply in the area will not be affected by the canal.

The full flow of the Withlacoochee River on the west side would remain available for hydroelectric power development at the Florida Power Corp plant near Inglis a few miles from the Gulf of Mexico.

Feasibility of the project was open to serious question during work progress on the job in 1935, and for that reason funds from the federal government were not forthcoming.

Bomb shelter in Palisades urged again by engineer

John C. Evans, chief engineer of New York Port Authority has called attention to World War II plans to hollow out bomb shelters in the New Jersey Palisades. Stating that the proposal, made in 1942, is of national importance and good for use in future wars, Evans has revived an idea with which he was credited at that time.

The original Palisades bomb shelter proposal was made by the late George J. Atwell, then president of the Thompson-Starrett Corp. The proposal had the approval of President Roosevelt and Governor Charles Edison of New Jersey.

The idea was to dig a tunnel 200 ft across and 100 ft high from the Hudson River through a mile and a half of stone to the New Jersey meadows without diverting critical materials.

The initial plan was to build a $5,000,000 shelter in the great bluffs with 200,000 sq ft of landing field alongside the Hudson River—the caves to accommodate some 50 to 75 planes, and repair facilities.

The overall program was to have cost $37,500,000 with large rooms to accommodate war factories and storage for art treasures as well as shelter. One room would provide an indoor arena seating 200,000 persons. The through-tunnels as proposed by Atwell would be self ventilating to maintain a year-around temperature of sixty degrees.

Evans points out that under current federal emphasis on bomb shelters with post war uses the through-holing could be located strategically for trans-Hudson crossings and provide refuge niches for New Yorkers going west in event of bombing.

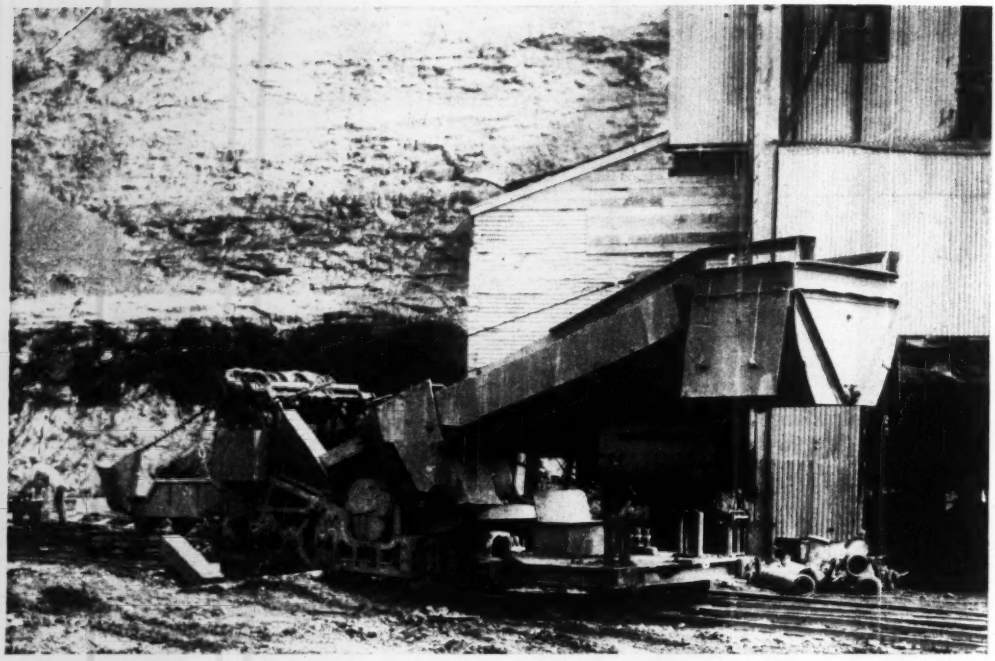
The original idea was inspired by the use of caves during the bombing of Chungking in 1942.

Indiana seeks harbor for industrial use

A proposal to construct port facilities in Porter County on Lake Michigan to provide an industrial harbor and terminal for Indiana is one of the aims of the Indiana Economic Council and the Indiana Harbor Commission, and will be aired before Army engineers in Washington January 31.

Economic justification for the project which will be called the Burns Waterway, and local cooperation deemed appropriate, will be examined by the Army engineers.

State officials favor the project in order to open up a whole new industrial future for the northern part of the state.



Mucking machine with special discharge hopper is chief reason why . . .

Garrison's big tunnels are moving fast

EQUIPMENT INNOVATIONS—both in the jumbos and the mucking machines—are credited by the tunnel contractor at Garrison Dam for unusually fast progress.

In the first place everything in the tunnels moves on wheels—most of it on rails mounted high enough on the rib steel to clear equipment and men passing underneath.

Second and more important—are two modifications of a conventional mucking machine, to permit continuous mucking. One is a divided hopper at the discharge end of the mucking belt for loading into dump cars operating on double tracks. The second feature is a push car coupled to the front of the machine to carry a second operator who controls the switching and loading of muck cars.

The resulting fast mucking, plus quick drilling and concreting from the jumbos, accounts for the fact that by Nov. 1 six tunnels had been holed through, three had been lined, and two were being mined. Work started in the fall of 1948.

Garrison Dam and reservoir—a multipurpose Army Engineer project on the Missouri River 75 mi above Bismarck, N. D.—is presently scheduled for completion in 1955 at a total project cost of $202,000,000 based on today's prices. Pertinent features of the project are shown in an accompanying table.

• **Eight tunnels**—The $15,000,000 tunnel contract calls for the mining and concrete lining of eight 1,200-ft tunnels complete with portals and two articulated sections of reinforced concrete tubes connecting between the portals and the penstocks of the power house. The downstream articulated tubes are 117 ft long overall, and the upstream tubes are 50 ft.

Five tunnels—for hydroelectric power—are 29 ft finished diameter inside of a 3-ft reinforced concrete lining. The other three are for flood control and reservoir regulation. Two are 22 ft ID with a 2-ft 6-in. lining; the other is 26 ft ID, with a 2-ft 9-in. lining.

Working around the clock, a heading in a 35-ft bore for one of the 29-ft tunnels is advanced 24 ft per day. Likewise, 24 ft of concrete lining is placed each day in these big tunnels. Mining of the smaller tunnels, (28-ft dia bore) consistently averaged 32 ft per day according to the job reports.

• **Test tunnel**—Prior to awarding the tunneling contract, the Corps of Engineers drove a 240-ft length of 36-ft dia test tunnel, which became part of Tunnel No. 4. It was reached from the downstream portal by 213 ft of 7x9-ft access tunnel—which experience showed to be the minimum size for efficient mucking.

Chief purpose of the access tunnel was to determine pressures of the "Fort Union Formation" in which the tunnels are located. Nothing much was known about the characteristics of this material other than that it is a compact clay which derives its strength from compaction under the weight of overburden, rather than from cementation.

It is believed that the test tunnel resulted in lower bids for tunnel excavation. Moreover, final designs for the tunnel rib steel, based on data secured in the test tunnel, is credited with ef-

fecting savings that offset several times the cost of the somewhat unusual investigation.

• **Double-track muck train**—One thing that makes for efficient mining is the size of the project tunnels. Double-track lines can be operated. It was this feature that led to the development of the two-way discharge hopper that is mounted at the rear of the mucking machine.

Mounted just below the upper end of the 28-in. endless conveyor belt, the hopper is a four-sided open box with a horizontal baffle plate of sheet steel rotating about its center. It is operated by a small air motor mounted on the rear of the mucker. A pinion gear driven by the air motor operates in a semi-circular rack to swing the gate up and down, discharging either to right or left.

• **Two mucking operators**—The mucking machine carries two operators. One positions the machine itself—which is self-powered and moves by electric drive traction—and operates the electric-powered ¾-cu yd dipper at the front end. The other operator controls the conveyor belt, operates the two-way discharge hopper and the air-tuggers that snake empty cars into position for loading.

A "California" switch in the double narrow-gage track permits empty muck cars to be shuttled from one track over to the other for loading. As each car is loaded, an air tugger hoist anchored to tunnel ribs pulls it out a few feet and couples it onto the muck train, which is pulled by an electric battery motor.

Loaded cars are emptied onto a temporary muck pile just outside the tunnels by a crane equipped with a special dumping yoke. The excavated material is loaded into dump trucks by a power shovel and hauled to a spoil area.

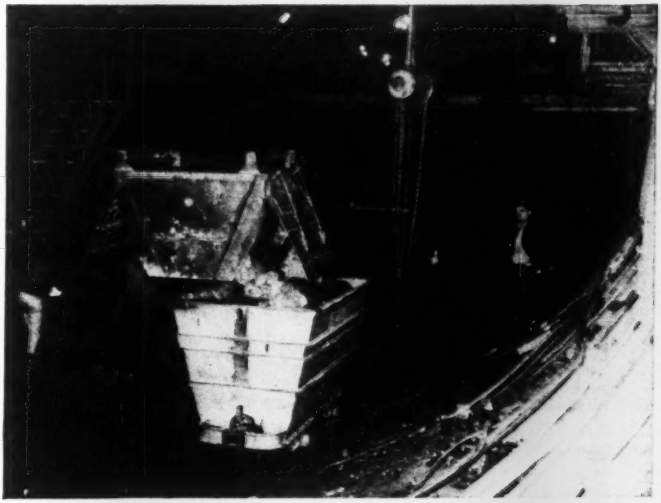
Material in the tunnel is a rock-like, highly consolidated, clay of the Fort Union Formation, containing layers of lignite. In fact, two coal seams, 4 ft and 8 ft thick, extend across some of the tunnel headings.

• **Drilling and shooting**—The material drills and shoots easily but requires a lot of timber lagging to hold possible "fall-outs" in place. Welded wire mesh is placed behind the lagging pans to prevent loose material falling on the workmen.

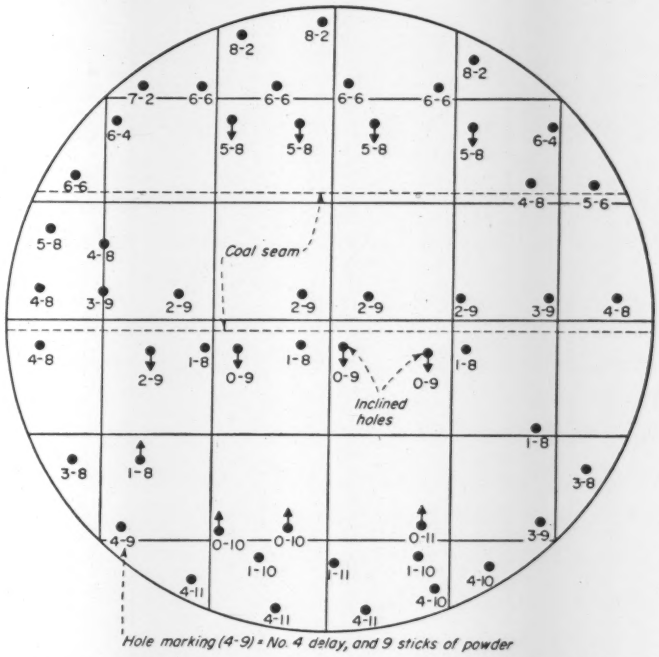
Tunnel headings are being mined full-circle, with production averaging 1 cu yd of excavation per 0.45-lb of powder. Two strengths of powder are used: 40% for the primer shot and 20% for the remainder of the load.

Holes are drilled 8 ft into the heading by hand-held air drills operating 1½-in. coal augers. A hole can be drilled in about 1½ min. Typical round for the 35-ft bore is 42 holes loaded with 408 one-third-pound sticks of powder. One primer stick is used for every three sticks of 20% powder.

Ordinarily 12 holes are "cut shots": 4 near the crown, 4 at the mid-height of bore, and 4 near the invert. All others are drilled straight in. The

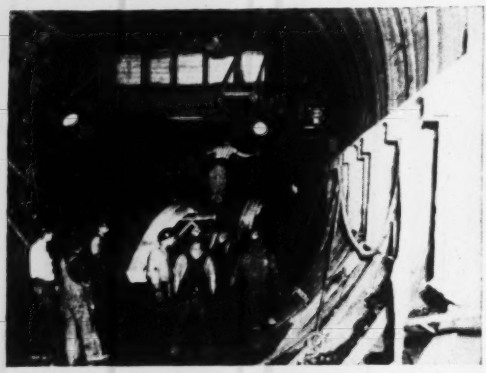


NO LOST TIME for the mucking machine—it loads right or left into muck cars that ride on a narrow-gage, double track system.

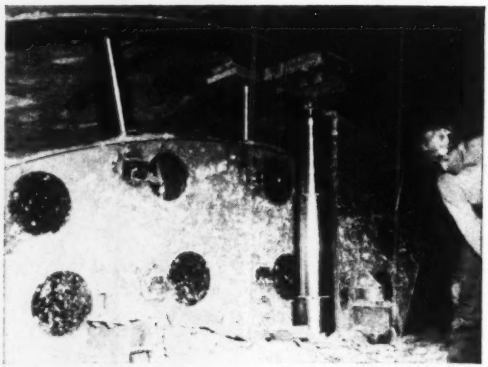


TYPICAL 8-FT ROUND in a 35-ft bore calls for 34 lb of 40% powder and 102 lb of 20% powder in 42 holes, for a yield of 1 cu yd of rock per 0.45 lb of powder.

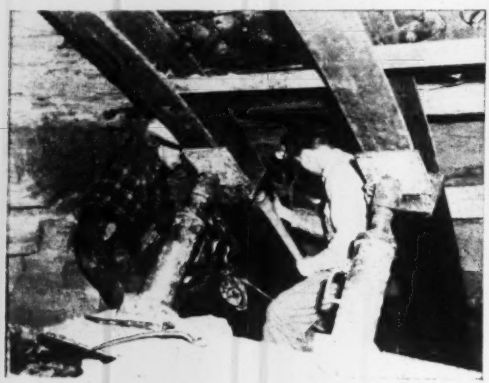
SETTING A RIB IN FOUR STEPS



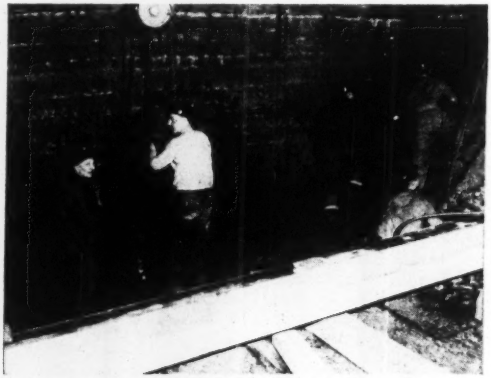
1. RIB STEEL is passed forward by a monorail hoist that is hung beneath the main jumbo.



2. CROWN SECTION is raised against the roof by a group of heavy-duty hydraulic hoists.



3. MECHANICAL JACKS on the jumbo hold crown in position while side segments are bolted in place.



4. INVERT SECTION is handled by chain hoist, to complete the 4-segment circular rib.

shots are fired in standard delays, numbered zero to 11.

• **Drilling jumbos set steel**—Special jumbos were made to do the drilling and to set the 4-piece rib steel. Two jumbos were made for the largest size tunnels and one each for the two smaller tunnels.

The jumbos operate on 100-lb rails supported on brackets attached to previously set tunnel rings. Rails are set just below the spring line to give 15½-ft minimum clearance from bottom of the frame of the jumbo to the invert of tunnel rings.

Three 30-in., 192-lb wide-flanged cross-beams, haunched at each end and reinforced with heavy welded gusset plates, form the main supports for the jumbo. One cross-beam is directly over the rear set of wheels; the other two are slightly forward of the front set of wheels.

From six to nine 33-in. 200-lb wide-flanged beams rest on top of the cross-beams, parallel to the center line of the tunnel. They cantilever 13 ft past the front cross-beam to give protection for the drillers and muckers. A solid timber working platform covers these longitudinal beams.

Two traveling jacking-cars, operating on 40-lb rails supported by diaphragms connecting the longitudinal beams, complete the major structural make-up of the jumbo. Drilling platforms are suspended from the cantilevered beams, with a hinged protective gate of welded rods hanging to within 8 ft of the invert to protect workmen from fall-outs in the heading.

The jumbo is equipped with 100-ton hydraulic jacks, and hand-operated jacks for setting the ribs and to support the tunnel roof until the ribs are set in place and bolted. Some jacks extend vertically and others operate at an angle.

When jacking above the cantilever section of the jumbo, the rear end is held down by "kicker-jacks" between the rear cross-beam and the crown of a previously set rib.

Some of the steel ribs are 8-in., 48-lb beams, but the majority are 10-in. 72-lb beams spaced 4 ft apart. They are erected in four quarter-circle segments—bolted together for mining and welded before placing the concrete lining.

• **Setting the steel rib**—All rib steel is brought up to the rear of the drilling jumbo and passed beneath it on monorails. A crown section is erected first. It is raised nearly to roof line by 100-ton hydraulic jacks. Then the roof is trimmed to fit the curvature of the rib so that it can be shoved into final position.

The weight of the rib is then transferred to mechanical jacks, and the ring completed by erecting the other

three segments. A second ring is erected, and lagging pans and wire mesh are put in place to protect the workmen below. All this time, miners are drilling for the next round.

• **Welding jumbos**—Working at some distance behind the rib-setting jumbo, and well ahead of concreting, is a welding jumbo. This rig also operates on rails carried on brackets attached to rib steel. There are two welding jumbos, each equipped with five 300-amp arc-welding machines. One welder can complete the four quarter-point welds in one complete rib, each 8 hr. Welding jumbos are moved by air-operated tugger hoists.

All equipment in the tunnel is operated by electricity or by air. A 440-v line serves the mucking machine, a 220-v line powers the welding machines, and a 110-v circuit furnishes lights. Tunnels are ventilated with blowers totaling 15,000 cfm in capacity. Air is forced up to the heading through flexible tubing, or fans can be reversed to suck dynamite fumes out of the tunnel.

• **Concrete is pumped**—Concrete for the 3-ft thick tunnel lining is pumped into place through an 8-in. line, from a batching and concrete mixing plant near the downstream portals. One booster pump is added to the system for each 800 ft of line. Inside the tunnels, the concrete lines are carried overhead on pipe jumbos running on railroad rails supported on the invert. Long sections of the concrete line are supported from the roof.

Invert sections of the lining are placed in alternate 24 ft monoliths.

MAJOR TUNNEL QUANTITIES

Tunnel excavation	325,000 cu yd
Steel beam tunnel-ribs	22,000,000 lb
Steel lagging	2,800,000 lb
Concrete lining	110,000 cu yd
Concrete portals	29,000 cu yd
Reinforcing steel	13,500,000 lb

TYPICAL 2-CU YD MIX FOR CONCRETE LINING

Cement	1,128 lb
Sand	2,275 lb
Aggregates:	
— ¾-in.	1,792 lb
—1½-in.	2,175 lb
Water	549 lb
Air-entraining admixture	425 grams
Water-cement ratio:	
5½ gal of water per bag of cement.	
Cement yield:	
6 bags per cu yd of concrete.	
Slump	5 to 6-in.
Air content	4%

PERTINENT DATA ON GARRISON DAM

PURPOSE: Flood-control, hydroelectric power, irrigation, navigation aid, municipal water supply and sanitation.

TYPE OF STRUCTURE: Rolled earth fill embankment of 70,000,000 cuyd, 210 ft above streambed and over 2-mi long.

SPILLWAY (East abutment): Concrete chute-type, controlled by 28 tainter gates 40 ft wide by 29 ft high.

OUTLET WORKS (West abutment): an intake tower, 8 tunnels, stilling basin and tailrace.

POWER CAPACITY: 240,000 kw initially; 400,000 kw ultimately.

RESERVOIR: Total capacity 23,000,000 acre ft, extending 200 mi upstream and covering 390,000 acres at maximum normal operating pool.

STORAGE ALLOCATIONS:

Dead storage (below El. 1775): 4,900,000 acre-ft.
Multiple-purpose storage (El. 1775 to 1838): 13,850,000 acre-ft.
Flood control storage, El. 1838 to 1850 (maximum normal operating pool): 4,250,000 acre-ft.

ESTIMATED BENEFITS (Annual):

Hydroelectric power (ultimate)	$6,685,000
Flood-control	2,100,000
Conservation	4,000,000

They are struck-off with a vibrating screed traveling on light railroad rails, fastened to steel bulkheads that form construction joints between invert and the remainder of the circular lining.

The entire circular section above the invert is poured in one operation, in 24-ft monoliths. Monoliths are tied together with heavy rubber seals. This concrete is placed outside of telescopic forms which can pass through the rib steel and through each other. There are eight sets of these forms, and three sets of form carriers. The concrete lining is heavily reinforced with 1¼-in. bars spaced from 8 to 20-in., in two layers.

Concrete is deposited behind the telescopic forms through two overhead concrete lines, with 90-deg elbows, feeding into elephant-trunk spouts which drop the concrete into place, without segregation of materials.

When the concrete lining has been placed up to about the 45-deg angle, the elbows and elephant-trunks are removed and the remainder of the crown section is placed by running the two roof pipes straight back to the previously placed section of lining.

Concrete lines then are retracted as pouring of the crown section progresses; with the last few cubic yards of concrete being forced in under pressure to fill completely up to the bulkhead at the front end of the 24-ft monolith.

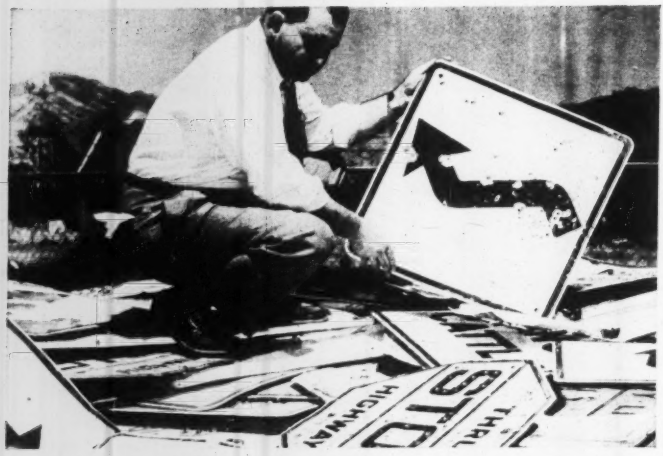
• **Handling the concrete aggregates**—Concrete aggregates for the concrete lining—1½-in., ¾-in., and sand—arrive at the job in bottom-dump railroad hopper cars. They are dropped into a track-hopper and elevated onto a 1,000-ft tripper conveyor. This tripper conveyor feeds onto a traveling stacker conveyor—through a 90-deg turn—which stockpiles the aggregates over a 7-ft dia reclaiming tunnel for later use.

Belt conveyors inside the reclaiming tunnel carry the aggregates a maximum of 1,920 ft to the concrete batching and mixing plant. Cement is unloaded from railroad cars into a 7,500-bbl silo and delivered about 1,500 ft to the concrete plant by a compressed air system.

During hot weather, cold mixing water and air-cooled refrigeration of aggregates keep the temperature of the concrete to a maximum of 60 deg F. During cold weather the aggregates are warmed with circulating hot air to produce concrete of 40 deg temperature, minimum.

• **Men in charge**—S. A. Healy Co., and the Material Service Corp., both of Chicago, hold a $15,000,000 contract for mining and lining the eight 1,200-ft tunnels. Nick Marsch, Jr., is project manager. Concrete aggregates, reinforcing steel and part of the tunnel rib-steel and lagging are furnished by the government, under separate contracts.

Garrison Dam is being built by the Garrison District, Corps of Engineers, under the supervision of Col. F. M. Albrecht, district engineer. John W. Sibert, Jr., is chief of the construction division, and E. L. Knutson is resident engineer on the tunnels.



MUTILATED SIGNS from Utah highways. Willard A. Kemp, assistant traffic engineer of the Utah State Road Commission, shows a typical example of how firearms are used to damage road signs.

Sign vandalism points to need for more strict law enforcement

James Joseph
Los Angeles Correspondent
Engineering News-Record

A NATION-WIDE SURVEY of highway maintenance engineers reveals that $1,400,000 is spent annually to replace road signs maliciously defaced or destroyed. In addition, more than 250,000 man-hours were expended by highway maintenance departments to repair or replace damaged signs during 1949, the last year for which figures are available.

Analysis of the state reports indicates that much of this large economic waste could be saved by more rigorous enforcement of laws against damaging highway signs or by passage of stiff laws against such injury in states without adequate legislation.

Some maintenance engineers report that signs last, on the average, no longer than one or two years. A few reported sign life in some regions as short as two or three months. The average, over-all life of highway signs, however, appears to be from 3 to 4 years, which is not more than 50 to 75% of normal expectancy.

• **Regional factors**—States hardest hit by sign mutilation are generally west of the Mississippi, and the damage rate is higher in areas where firearms are more commonly carried—as in much of the far West and Southwest. A notable exception is California, one of the few states where enforcement of the law against sign damage is strict.

The largest state reported the largest annual loss. The maintenance engineer of Texas, P. S. Bailey, estimated that of the $845,991 spent on sign maintenance during a period from Sept. 1, 1948 through Aug. 31, 1949, fully $200,000 was spent in replacing mutilated signs—and that 100,000 man-hours were wasted in the process.

Smallest sign damage was reported by Wisconsin and New Hampshire—about $5,000 annually—yet both said that 10,000 man-hours were needed for even this minimum replacement.

Nevada's traffic engineer, Ralph J. Ottini, revealed that fully 20% of his state's signs must be replaced annually. While this is about average, it is significant considering Nevada's small population. Damage is usually inversely proportional to population.

Minnesota reported the highest loss for any state outside the far-western or southwestern area. Some $50,000 was spent in 1949 for re-signing due to mutilation. This is slightly less than 20% of the annual $280,000 which Minnesota spent for road sign installation and maintenance.

Areas with least mutilation were the northeastern and eastern states, notably New York and Delaware. Although New York's assistant superintendent of highway operation and maintenance, O. Hasbrouck, reported no definite figures available, he estimated road-sign destruction to be "a very low figure."

• **Favored targets**—Vandalism involving shooting and defacing were given as the most frequent causes of sign destruction. Many state highway departments have abandoned reflectorized signs—especially those with glass buttons—because these seem to be favorite targets for hunters and vandals. Nevada, in an open letter to the public, admitted recently that reflectorized signs whose "average life should be at least six years, must in many cases, be replaced in as short a time as three months."

At least one state, Alabama, reported "a definite decline in vandalism of reflector units or buttons." Yet at the same time, Alabama's traffic service engineer, N. C. Brooks, revealed that in some sections of the state where 4x4-in. concrete posts (reinforced with four ⅜-in. steel rods) are used, many have been found fractured.

Kentucky reported that "deliberate acts of vandalism" damage or destroy annually more than 10,000 metal road signs. During 1949, Kentucky spent $42,450 to recondition 33,500 signs.

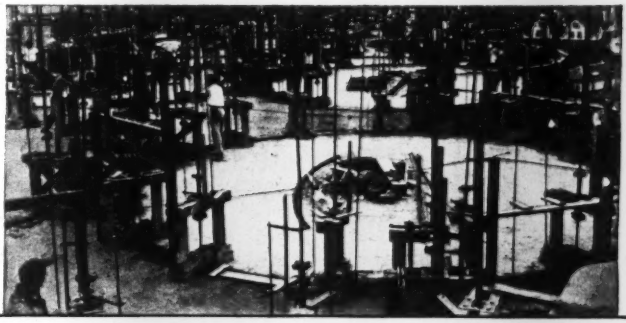
Practically all states using wooden sign posts report more damage than those using steel posts. Some far western states said Indians uprooted wooden posts for firewood, and that reflectors were especially popular for saddle and belt decorations.

Many states reported a desire to switch from porcelain-metal road signs to lighter, cheaper aluminum signs covered with reflective material. But prevailing vandalism is preventing the change-over. Utah, which uses many aluminum signs covered with reflective material reports 25% replacement of its more than 30,000 signs in 1949.

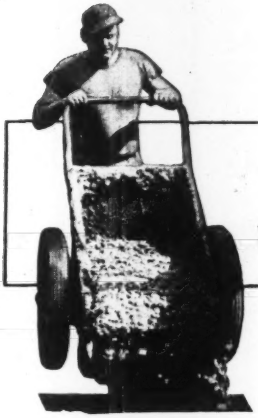
• **Intertown jealousy**—Vandalism involving town jealousies has caused at least one state, Idaho, to change its junction marking system. Previously, Idaho included mileage figures on signs at junctions—allowing motorists to choose the shortest route to their destination. So many junction signs were destroyed by towns zealous for motorists' patronage, that Idaho has now removed all mileage figures from junction signs. Instead, motorists are allowed to choose a route; then, a few miles past the junction, supplementary signs reveal the mileage.

California, unlike most western states, reported only 5% damage by mutilation—and an expenditure of only $12,000 for repair and replacement.

California appears to have the stiffest penalties for highway sign mutilation—a maximum of six months in jail or $500 fine, or both. Most maintenance engineers complained that their state laws are too lax. Some states reported no penalty whatever.

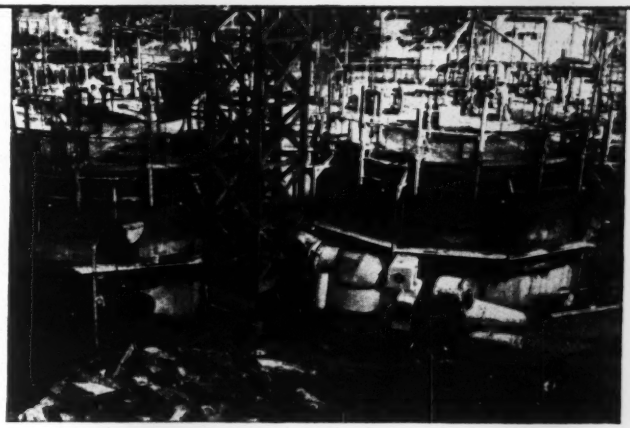


Forest of jack rods and temperature steel ready for pouring concrete walls.



No drop-outs, no honeycomb with LEHIGH Air-Entraining Cement

Distribution of aggregate was uniform, the concrete highly plastic and cohesive—characteristics of concrete made with Lehigh Air-Entraining Cement.



Job progress was constant around the clock, with bin walls 130 feet high completed in ten days.

Builders: WILLIAM NEILL CONSTRUCTORS, INC., 30 Vesey St., New York City. Ready Mix Concrete: HENRY K. SMITH, Palmyra, Pa.

Sixteen cacao-bean storage bins, with a capacity of 32,000 tons, equipped to take train-lots and to unload at the rate of 110 tons per hour! This new construction is a striking example of the continuous progress of the world's largest manufacturer of cocoa and chocolate—Hershey Chocolate Corporation, Hershey, Pennsylvania.

These bins of slip-form construction are the largest of their type built for cacao-bean storage . . . and for the plastic, cohesive and uniform concrete, essential in this method of construction, the builders, William Neill Constructors, Inc. used Lehigh Air-Entraining Cement with these results:

Although the air-entrained concrete required less water, placing and consolidating around the reinforcing was much easier . . . excessively wet batches that cause drop-outs and honeycomb were avoided . . . the work was completed ahead of schedule. And the surface of the concrete was so dense and smooth that little finishing was needed.

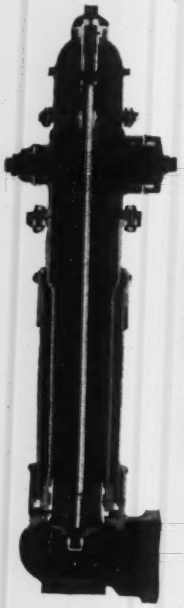
Our Service Department will be glad to help you with your specific problems.

Lehigh CEMENTS

LEHIGH PORTLAND CEMENT COMPANY

ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

LEHIGH PORTLAND CEMENT • LEHIGH EARLY STRENGTH CEMENT • LEHIGH AIR-ENTRAINING CEMENT • LEHIGH MORTAR CEMENT



Ease of maintenance. The operating thread in this hydrant of rugged, simple construction is the only part to be lubricated—and then only on occasions of regular inspection and maintenance. The thread is protected from moisture from both the system and the elements.

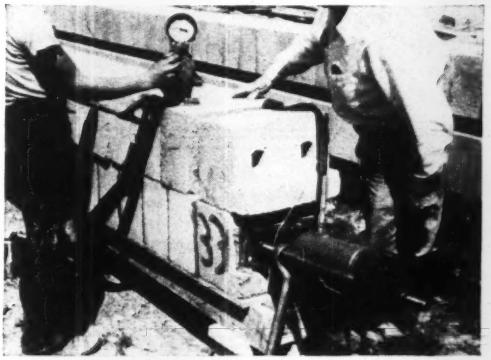
MATHEWS HYDRANTS

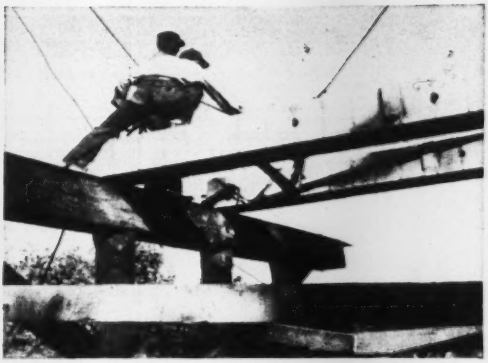
Made by R. D. Wood Company

Public Ledger Building, Independence Square, Philadelphia 5, Pa.

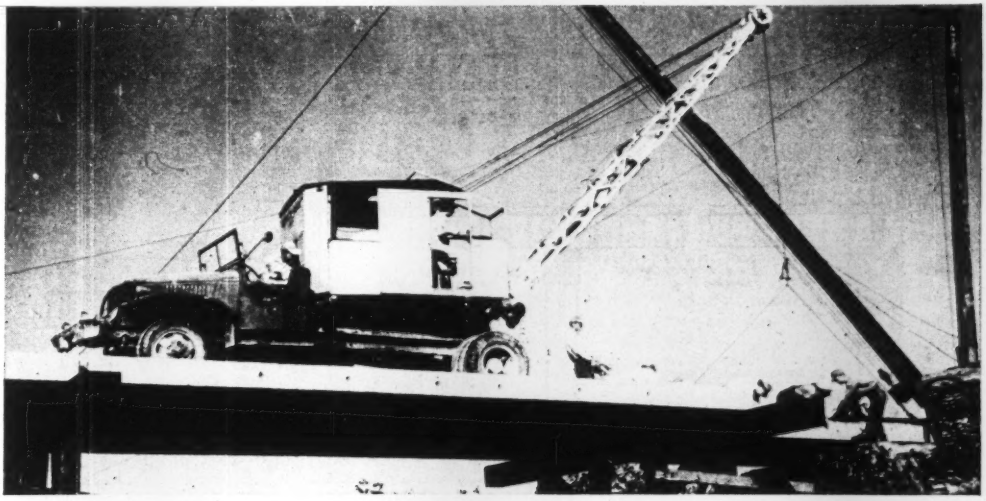
Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

MATHEWS MODERNIZED HYDRANTS OFFER THESE ADVANTAGES: All working parts contained in quickly replaceable barrel • Stuffing box cast integral with nozzle section — positively leakproof • Head turns 360° • Replaceable head • Nozzle sections easily changed • Nozzle levels raised or lowered without excavating • Protection case of "Sand-Spun" cast iron for strength, toughness, elasticity • A modern barrel makes an old Mathews good as new





CONCRETE BLOCKS prestressed with a hydraulic jack (left) form beams 20 and 30 ft long. Placed side by side . . .



BLOCK BEAMS comprise a three-span bridge capable of safely sustaining H 10-44 loading or one H 15 truck.

Bridge built of blocks strung like beads

A TECHNIQUE that converts strings of concrete block into prestressed beams —and lowers construction costs—has been applied successfully to two structures in Tennessee.

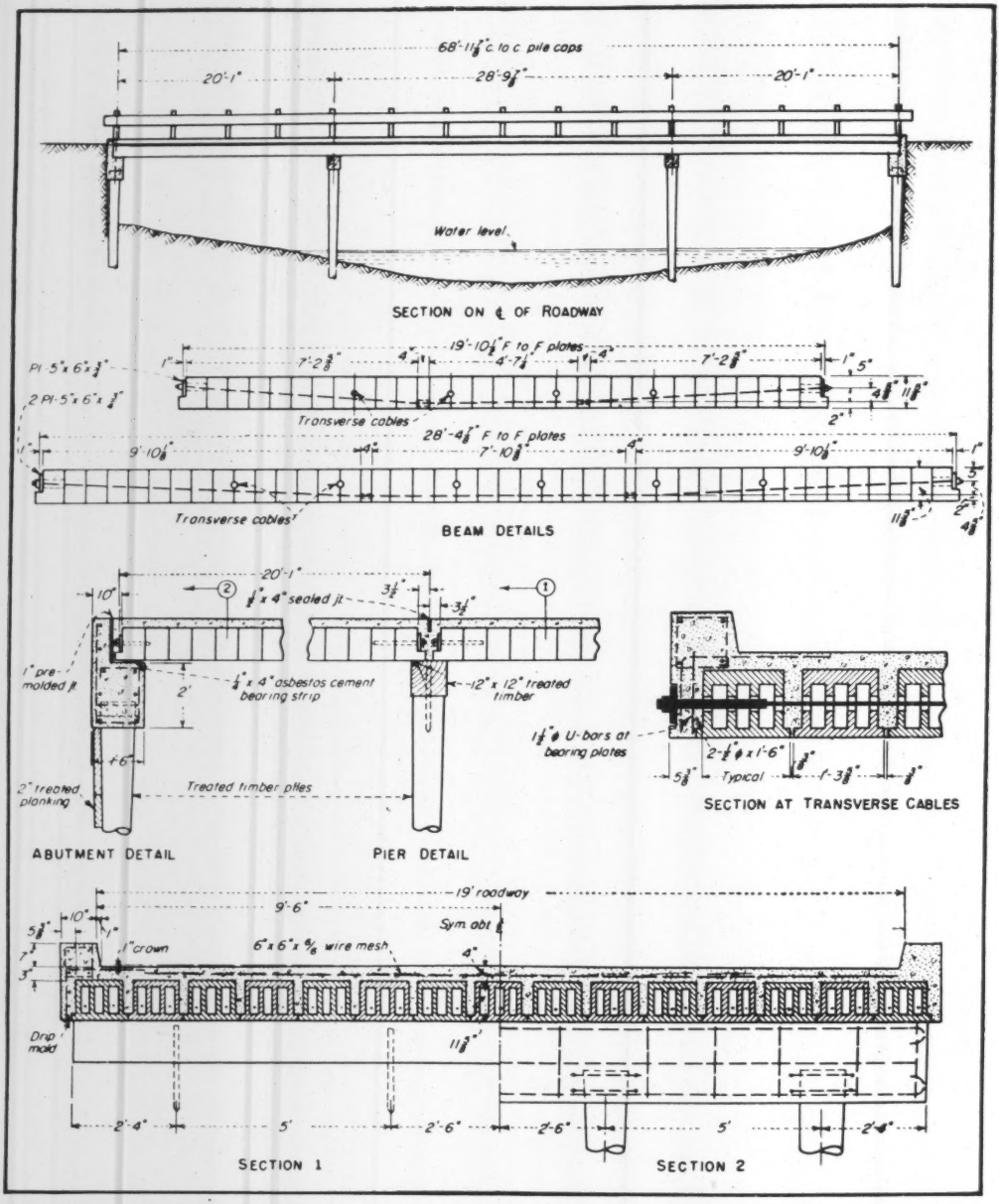
One of these is a highway bridge in Madison County, about 15 miles north of Jackson, with 20 and 30-ft spans. It was built by stringing standard, machine-made, hollow concrete block on cables, like beads on a necklace. When the cables were tensioned, the blocks were converted into beams rigid enough to sustain H 10-44 loading or one H 15 truck.

Cost of the deck alone, including a cast-in-place roadway slab and curbs, was about $1.90 per sq ft. Engineers for John A. Roebling's Sons Co., developer and supplier of the special strands and end fittings used for prestressing, estimate that this method of construction saved between 40 and 50 c per sq ft over other permanent-type designs.

Opened to traffic Oct. 28, this was the first prestressed concrete bridge to be completed in the United States. (The Walnut Lane Bridge in Philadelphia was started earlier but had not been completed at the time the Madison County bridge was officially opened.)

• **Many studies made**—The block-beam method of construction and the bridge design were developed by Bryan and Dozier, consulting engineers. Until the prestressing bug bit them, they had an ordinary practice in Nashville, Tenn. Now, they have several prestressed-concrete structures under construction or on the drawing board and many more in prospect. This is how it came about:

Two years ago, Ross Bryan decided to devote his time to a study of prestressing, with the thought that he could thus broaden the services of the firm. In this way, he became acquainted with the principle that tensioned cables could convert precast concrete units into a monolithic structure. The idea then occurred to him



BRIDGE is made up of 45 block beams, 15 per span. Transverse prestressing ties beams together in each span.

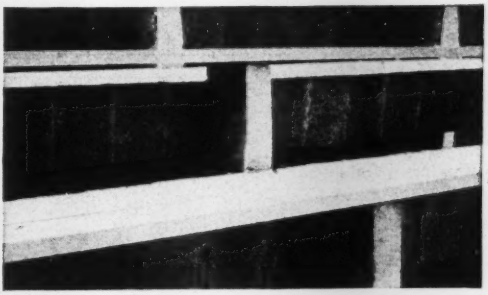
that economical prestressed structures could be built if ordinary building blocks were used as the concrete units.

Bryan took his idea to Carrol Strohm, president of Nashville Breeko Block and Tile Co. Since this plant was operating full blast at the time, Strohm was not anxious to take on new work but finally decided to assist in the research and make test beams. The more tests that were made, the more enthusiastic both men became. Soon, they had the method developed to a point where they were ready to build their first large-size structure.

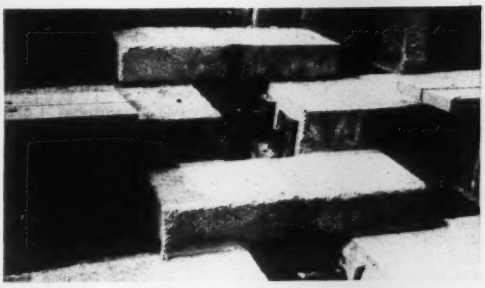
Knowing that there was a market for low-priced bleacher stands, Bryan and Dozier turned out a design in which use was made of block beams. Then, with Strohm's assistance, they erected a full-size demonstration stretch of stands 20 ft long.

Among the people who were in-

BLEACHER STANDS for Fayetteville high-school football field were built of prestressed block beams.



SEATS were supported on concrete-block brackets.



SPACES between ends of the beams were filled with concrete to complete stairways, which are located at piers.

vited to see load tests on the stands was Charles R. Lindsay, principal of the Fayetteville High School, which needed stands for a football stadium. Convinced of the structural soundness of the design, Mr. Lindsay was particularly attracted by economy of construction, since money available for the high-school stadium was inadequate for one of conventional design.

Shortly thereafter, stands designed by Bryan and Dozier were built at Fayetteville under Mr. Lindsay's supervision at a cost of about $7.65 per seat. Roebling's engineers estimate this to be about half that of comparable, reinforced concrete stands and believe it compares favorably with better grades of prefabricated steel bleachers with wood treads and seats.

Tests also persuaded Madison county highway engineers to try block-beam construction for a bridge. They saw in it a possible solution to the secondary-road bridge problem.

• **First block-beam bridge**—A bridge 15 miles north of Jackson was selected for the initial trial. Designed for two lanes of traffic, it consists of three simple-beam spans supported on timber pile bents. The two outer spans are 20 ft each, and the center is about 30 ft.

Each span consists of fifteen 16-in. wide, 12-in. deep block beams placed side by side. After a concrete roadway slab and curbs were cast over and between the units, the beams in each span were tied together with transverse prestressing cables.

Beams are composed mostly of standard, machine-made 8 x 16-in. by 12-in. deep concrete blocks. However, special end blocks, against which the strands are anchored, and depresser blocks, which hold the strands in place vertically, also are required.

The standard blocks have three rectangular openings, through which strands may be passed, and a bottom flange that projects about 1 in. beyond the outer webs. Blocks and mortar have an ultimate compressive strength of 3,750 psi.

End and depresser blocks, though also machine-made, were specially designed for this job. End blocks have circular holes at about mid-depth for the strands and an anchorage surface sloped in accordance with the angle the strands make with the vertical. Depresser blocks, inserted at span quarter points, were designed to hold the strands 2 in. from the bottom of the beam in the center half of the span. This eccentricity gives a greater prestress where stresses caused by dead and live loads are largest.

• **Factory fabrication**—Beams were made up by the Madison County highway maintenance crew in its working quarters at Jackson. One beam was assembled at a time on a table, starting with an end block with strands attached. One strand was used for each 20-ft beam and two strands for each 30-ft beam.

Prestressing strands are composed of 7 wires each. Galvanized for protection against corrosion, they are 9/16-in. dia. A fitting is attached to each end and a threaded stud is inserted in the fitting. Turning a nut on this stud permits adjustments to be made in tension. The nut acts against a 5 x 6-in. by ¾-in. steel plate, which distributes the prestress over the end block.

Buttered with mortar on one side, successive blocks were strung on the strands and pressed against a previously placed block. After the second end block was attached, an initial tension of 10,000 lb per strand was applied (equivalent to an average compressive stress on the concrete of about 100 psi for single-strand beams). The mortar was permitted to set and cure overnight. Next day, the final prestress of 26,000 lb per strand was applied with a hydraulic jack.

This prestress is equivalent to about 125,000 psi on the strands—well below the objectionable creep range. The designers assume that plastic flow of the concrete may decrease the

tension to 105,000 psi, at which time the average prestress on the concrete in single-strand beams would be about 230 psi. At mid-span, while carrying their own dead weight, these beams would have a compressive stress of about 470 psi in the bottom fiber and zero in the top fiber. Double-strand beams, used for longer spans, would have zero stress in the top fiber, and up to 940 psi compressive stress in the bottom fiber.

• **Crane placed beams**—Under the final prestress, the block beams were self-supporting and were safely transferred to storage. When needed, they were trucked to the site.

Starting at one approach, a crane placed the beams for an end span. Then, 3-in. planking was placed on these beams and the crane operated on this span to erect the center span. Finally, the crane moved out on the 30-ft span to set the members for the other end span. In each case, as the beams were placed, 7-wire strands for transverse prestressing were threaded through holes provided between blocks at mid-depth.

After all 45 beams were in position, a concrete slab with integral curbs was poured over them. Designed for a strength of 3,000 psi, this slab is 3 in. thick at the edges and 4 in. thick at the center. It also occupies the 2-in. space between beams due to the bottom flange projections, and fills a 2-in. gap left between the bottom flanges of adjoining beams to assure penetration of the concrete. When the slab had cured sufficiently, each of the transverse strands was tensioned to 26,000 lb with a jack.

The 45 beams were assembled and prestressed in a little less than three days. Erection took about two days. And the cover slab and curbs were cast in one day. Since high early-strength cement was used, only 7 days was needed for the slab to attain proper strength, and therefore, the bridge was available in less than two weeks after erection started.

• **Prestressed stands**—Block beams for the high-school stadium in Fayetteville are similar to those in the bridge. They are made of 8 x 16-in. by 12-in. deep, hollow concrete blocks, of 3,750-psi compressive strength, which were designed by Bryan. Prestressing of each beam was accomplished with two galvanized steel cables. These pass through openings in the blocks and are anchored against steel bearing plates at the ends.

Beams are 31 ft long. Forming walkways and supporting the seats, they span 30 ft between 16-in. wide piers of conventional concrete-block construction. Tops of the piers are staggered to receive the beams and concrete-block steps.

Seats are pairs of 2 x 6-in. wood planks. They are bolted at 5-ft intervals to concrete-block brackets, which are mortared to the side of the beams and rest at one edge on the walkways. These brackets also improve the rigidity of the structure.

The only poured concrete required was for the pier footings, for filling the small spaces between abutting ends of the block beams and for the short flight of steps leading from the field to the front aisle.

The stadium is 190 ft long, 32 ft wide and 17 ft high. It provides seating facilities for 1,525 spectators. Construction was completed in 32 working days by a crew of nine men composed of two block masons, one carpenter, five laborers and one foreman. Total cost, including engineering fees, was $11,500.

Notes on legal decisions

Summaries of decisions relating to construction work prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill Book Co.)

Rescission of bid

A contractor submitted a bid for the construction of a garage for Broome County, N. Y., in the amount of $116,952. The next lowest bid was $145,550. Accompanying the low bid was a check for $5,900, representing five percent of the amount of the bid, the "Notice to Bidders" requiring a five percent deposit "as a guarantee that bidder will enter into the contract if awarded the same."

The low bid was submitted on May 1, 1950, and the Board of Supervisors awarded the contract to the low bidder. On the same day, the contractor discovered that one of its office employees had failed to insert a figure of $38,062 when compiling the bid and consequently the submitted bid was that amount less than intended. On May 3 the low-bid contractor orally notified two members of the Board of Supervisors and on May 4 he orally notified the Superintendent of Highways of the error. On May 10 the contractor, by letter of its attorneys addressed to the Board of Supervisors, attempted to withdraw its bid in accordance with its previous oral notification and requested the return of its guarantee payment of $5,900.

At a special session of the Board of Supervisors held on May 16, the low bidder having failed to execute the contract, rescinded its resolution of May 2 awarding the contract to the low bidder and awarded the contract to the next lowest bidder, whose bid was in the amount of $145,550. The deposit of $5,900 made by the lower bidder was not returned to him.

The low bidder brought an action in equity to rescind the bid and to secure a return of the deposit money less $60 expenses allegedly incurred by the county by reason of the special session of the Board of Supervisors.

The court rendered judgment rescinding the bid and directing a return of the deposit money.[1] In its opinion the court noted that the contractor's explanation of its error was credible and that the omission was made without any attempt to defraud the county. By reason of the mistake on the part of the contractor no actual bid remained as "there was in the eye of the law no meeting of the minds at all." The court cited cases to sustain its position that it may rescind the apparent bid for the mistake of one party only, without finding fraud or inequitable conduct on the part of the other party.[2]

The court in referring to a case[3] that the attorney for the county had cited to support its claim to the right to retain the deposit money, pointed out that it was clearly distinguishable in that in the case cited the contractor "submitted his bids on Oct. 2, 1946, and discovered errors therein to his detriment the same day. He was awarded the contract on Oct. 21, 1946, but never executed it. He did not advise the defendant city that he made a mistake in his bids until Feb. 3, 1947, when he commenced an action to rescind the bids. Because of his inexcusable delay, he was denied relief and he forfeited his $5,000 deposit.

"In this case plaintiff [low bidder] promptly notified the county of the mistake. Without the necessity of re-advertising, the county was able to award the contract to another bidder."

Statutes in some states provide that once the bid has been submitted, it cannot be withdrawn. See, ENR, July 8, 1948, p. 118.

(1) Frank W. O'Connel, Inc. v Broome County, 98 N.Y.S. 2d 1009. (Supreme Court of Broome County, N. Y., July 21, 1950.)

(2) Moffet, Hodgkins, etc Co. v City of Rochester, 178 U.S. 373, 44 L.Ed. 1108. City of New York v Dowd Lumber Co., 140 App. Div. 538, 125 N.Y.S. 394.

(3) Brendese v City of Schenectady, 194 Misc. 150, 85 N. Y. S. 2d 856, affirmed 273 App. Div. 831, 75 N. Y. S. 2d 884, affirmed 297 N. Y. 965, 80 N.E. 2d 355.

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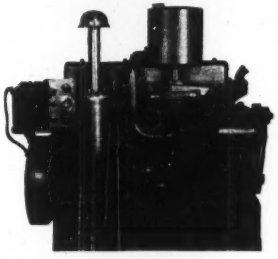

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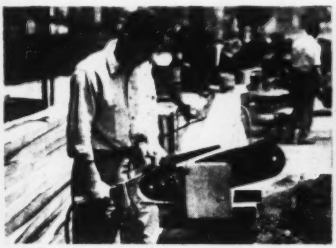

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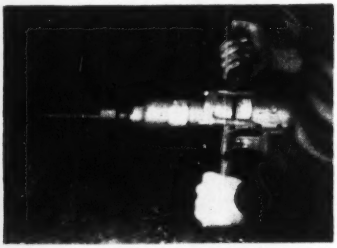

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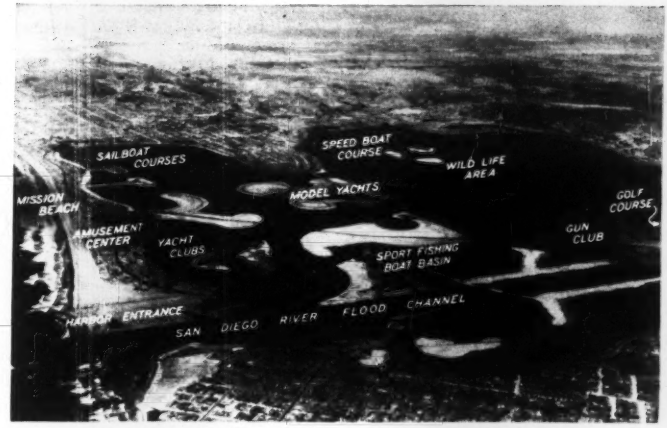


MISSION BAY in San Diego, landlocked for many years, is being developed as a recreational area. The San Diego River has built up a delta area (at the far right) but will be confined to a flood channel to further prevent silting.

San Diego builds playground

COOPERATION of city, state, and federal construction agencies is enabling San Diego, Calif., to build a $24,000,000 ocean-front recreational area. Involved are 29,000,000 cu yd of dredging over a 14-year period; the construction or reconstruction of seven bridges; and the building of three jetties—two of which extend a half mile beyond the surf line.

• **River diverted before**—Many years ago the federal government diverted the San Diego River to Mission Bay, from its original mouth in San Diego Bay. This has resulted in the building up of a large delta 3 miles from the Pacific Ocean. In the process some 1,000 acres has become marsh land. Because of this building up, heavy flood flows endanger the developed area surrounding the bay.

As a protective measure, a 3.3-mi, 800 ft wide, 115,000-cfs capacity flood channel is being built by the Army Corps of Engineers, to keep San Diego River waters out of Mission Bay.

Federal participation will also be involved in the construction of deep-water (20 ft-depth at mean low tide) Mission Bay entrance channel, and anchorage and turning basins. This entrance will be kept separate from the flood control channel since heavy silt deposits are anticipated in the channel during low flow periods. These deposits will be easily washed out when floods occur.

The entire project covers 3,600 acres of land and water—1,900 acres of water and 1,700 acres of publicly owned property surrounding the bay.

Present area of bay is 2,400 acres. Dredging of 200 acres (deepwater turning basin) to a depth of 20 ft below mean low tide and the remaining 1,700 acres to 8 ft below mean low tide will yield enough spoil to build up adjoining land and reduce water area to 1,900 acres. This built-up land will be used for picnic areas, beaches, boat landings, yacht clubs, slips for rental, golf courses, gun club, wild life area, resort areas, hotels, motels, scout camps, and other facilities. Areas in the bay will be or already have been set aside for speed boat courses, model yacht ponds, and wild life.

• **Financing**—Congress has authorized expenditure of $10,000,000 on the project for flood control and navigation features. Of this, $6,000,000 has been appropriated and $4,500,000 spent.

State of California money comes through funds available for construction of flood control projects (California water resources act of 1945).

City money comes from bond issues and capital outlay funds with $5,500,000 available to date and $4,500,000 to be authorized in future bond issues. The city's investment will be self-liquidating. This is how the city gets its money back:

At completion, now planned for 1960, city officials estimate that Mission Bay Park will result in $800,000 a year direct revenue to the city, from leases of city-owned land for marine service stations, yacht clubs, restaurants, cottage groups, hotels, trailer parks; taxes on improvements placed on the leases; operation of golf courses, gun clubs, baseball park, roller skating arena, and taxes on boats.

Besides the direct revenue, a large amount of indirect revenue is expected through increased tax base on adjoining property and an increase in city sales and business tax collection as the result of increased volume from tourist trade. Glenn Rick, city planning director, has said, "It is our belief that, if Mission Bay Park had been completed during the summer of 1950, it would have doubled the city's tourist business, estimated at a gross of $40,000,000."

• **Jetty construction**—First phase of the work completed is the construction of the three jetties by the Corps of Engineers. The south jetty forms one side of the San Diego River flood channel and extends only to the surf line. The middle jetty is 3,670 ft long and extends 2,600 ft beyond the surf line. The north jetty stretches 3,700 ft but extends 230 ft farther out into the ocean than the middle jetty.

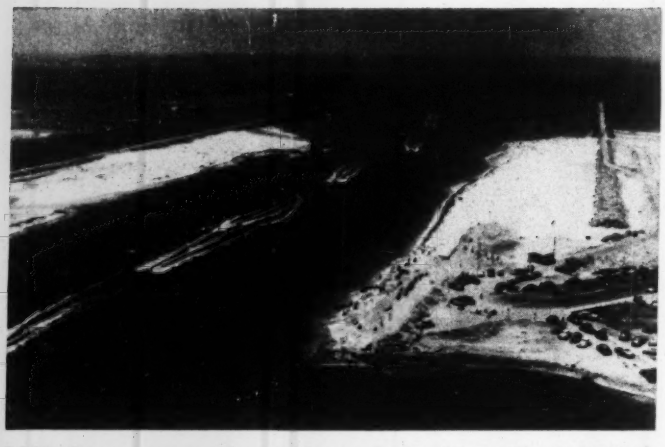
The middle jetty separates the flood channel from the Mission Bay harbor entrance. It ends in 25 ft of water, whereas the north jetty ends in 30 ft of water. The tops of the jetties average 16 ft in width except that the seaward ends are 25 ft wide. Rock protection slopes 2 on 1 on the navigation channel and 3 on 1 on the floodway channel.

The south jetty protects existing property south of the channel. It extends only to the surf line because it is desired that silt from the flood channel filter southward and not across the navigation channel into the bay. The north jetty was built farthest seaward to prevent shoaling across the navigation channel by littoral drift which is generally southward.

Engineers anticipate that the flood

TABLE I—WHERE THE MONEY COMES FROM

	Total to be Provided	Already Spent	On Hand	To be Raised
City	$10,000,000	$3,500,000	$2,000,000	$4,500,000
State	4,000,000	750,000	1,500,000	1,750,000
Federal	10,000,000	4,500,000	1,500,000	4,000,000
	$24,000,000	$8,350,000	$5,000,000	$10,250,000



DREDGE opens permanent channel entrance connecting Mission Bay with the Pacific Ocean as speed boats take part in civic celebration. Jetties will protect harbor entrance from shoaling by littoral drift.

TABLE II—BRIDGES TO BE BUILT OR REBUILT

Name	Location	Present Satus	Remarks	Estimated Cost
Ventura Blvd. Bridge	Divides deep-water (20 ft) from shallow (8 ft)	Temporary timber and steel in use	Will be steel and concrete with 50-ft sail-boat clearance	$1,750,000
Midway Drive Bridge	Crosses flood channel	Near completion	1,293 ft long, 11 continuous girder spans	1,000,000
US 101 Bridge	Crosses flood channel	Plans complete	Extend existing bridge from 640 to 940 ft	400,000
Morena Blvd.	Crosses flood channel east of Mission Bay	Plans in process	Extend existing bridge from 400 to 1,100 ft	500,000
Santa Fe Rwy Bridge	Crosses flood channel	Under construction	Extend single track steel bridge from 400 to 890 ft	700,000
Sunset Cliffs Bridge	Crosses flood channel nearest entrance	Plans complete	Continuous girder spans	1,000,000
Bay Blvd. Bridge	For road over interior channel. Dredged fill not yet made	Proposed		210,000

channel will be closed at the mouth due to silt deposited during the very last stages of flood flow. Floods are infrequent, but when they do come it is expected they will wash out the silt "like sugar in coffee." Amount of silting from actual flood action will depend on whether the tail of the flood hits at high or low tide. If at low tide, the velocity will be sufficient to keep the material in suspension until it reaches the sea and there will be little deposit in the floodway proper.

Floods seem to come in an 11-year cycle—the largest having hit in 1916, 1927, and 1937. Floods of really large proportions seem to come about once every 50 years.

Rick expects that the flood channel "will require some maintenance" from silting. He further expects littoral drift to result in heavy deposits north of the north (longest) jetty. In time, this may begin to turn around the end of the jetty and require maintenance dredging or extension of the jetty.

• **Dredging**—The mouth of the San Diego River floodway is the old mouth of the bay. A new harbor entrance has been dredged just north of the floodway mouth between the middle and north jetties. At present this entrance is only 350 ft wide and 8 ft deep. It will ultimately be 700 ft wide and 20 ft deep.

Total involved in dredging work is 29,000,000 cu yd. Of this, 20,000,000 cu yd will be dredged by the city to take the bay down to an 8-ft depth.

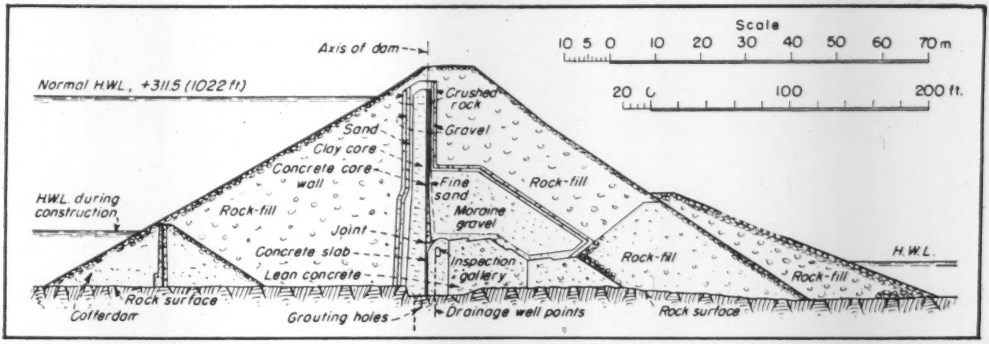
The Corps of Engineers will dredge out 9,000,000 cu yd. Besides the flood channel, this includes: The 20-ft-deep entrance channel and in the bay a main channel and turning basin 3,500 ft long and 100 ft wide, and two anchorage basins, one 3,000 ft long and 800 ft wide and the other 1,600 ft long and 800 ft wide, all to a depth of 20 ft. One of the deepwater anchorage basins will be developed to base commercial and sport (oceangoing) fishing boats. Already moved is 6,500,000 cu yd by the city from the bay. The Corps of Engineers have moved 2,000,000 cu yd, half from the floodway channel and half from the entrance channel.

• **Bridges**—All of the bridges in the work cross the floodway channel with the exception of Ventura Blvd. and Bay Blvd. bridges. For that reason, state money is available for most of them. Federal money is available through the Corps of Engineers for the one railroad bridge that crosses the channel.

Biggest bridge built to date is the Midway Drive Bridge, to be completed late this year (1950). It's 1,293 ft long, spanning the 800-ft floodway channel at an angle. Supported on two abutments and ten reinforced concrete piers built on untreated wood piling, the bridge is of continuous girder construction with cantilever and suspended spans alternating. It was built in the dry and the flood channel will be ultimately dredged underneath it.

To preserve the natural fish and wild life, some of the bay area is to be left in its natural state. Eel grass will be planted to encourage wild fowl development. This plan results from a study by the Scripps Institute of Oceanography at nearby LaJolla. Local fish, wild life and health agencies cooperated in this phase of the planning.

Others concerned in addition to Mr. Rick, are Tom Allen, Mission Bay project engineer for the city; Col. W. D. Luplow, district engineer for the Los Angeles District, Corps of Engineers, in general charge of the work, and Gordon A. Lilley, resident engineer.



ROCKFILL in the upstream part of the dam was not compacted as thoroughly as that in the downstream side to make certain that it would not settle less than the clay core. Lean concrete shown back of the cutoff wall in this drawing was used only in the deepest part of the channel.

Unusual rock-fill dam built for power in Sweden

A ROCK-FILL DAM having unique design elements has just been completed for the Harspranget hydroelectric project in Sweden. This new undertaking, the largest power project in Sweden, is on the Stora Lulealv River, about 30 miles above the Arctic Circle. It is the second of seven power projects proposed for that watershed.

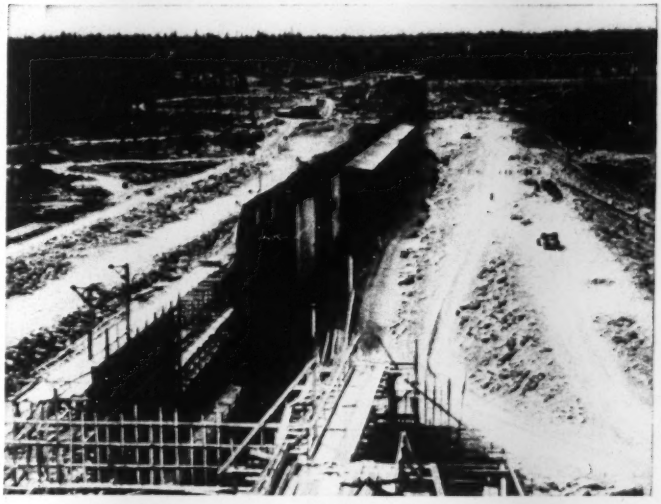
When first proposed—in 1918—a concrete arch dam was planned, but in the intervening years the Swedish State Power Board has adopted the use of earth or rock-fill dams in which materials excavated from underground power stations and tunnels can be utilized instead of being wasted. However, at the Harspranget site, the scarcity of material from which to build an impervious core made necessary a departure from normal design practices for rock-fill dams. For watertightness in this dam, a narrow core of rolled clay was built against a thin corewall of reinforced concrete.

The main dam is 148 ft high and 2,560 ft long, supplemented by a low dam on the left bank 2,130 ft long. To unwater the site, a diversion tunnel 820 ft long and having a cross-section of 1,076 sq ft was driven under the area to be occupied by the dam and a rock cofferdam with a concrete core was built across the channel where it could be incorporated in the upstream toe of the dam. Sound rock underlies the site except near one end. There a fault zone lies under the surface, but it is located at a point where the dam's height is insignificant.

• **Corewall design**—A rigid concrete core wall, keyed into the underlying rock, was proposed originally, but since the amount that this wall would deflect downstream under water load could not be accurately computed, the design was altered to provide for a small deflection. The design finally adopted, shown in the accompanying drawings, is expected to keep the stress in the concrete below 1,140 lb per sq in.

The upstream part of the cutoff block to which the corewall is attached is made of a good grade of concrete; lean concrete went into the downstream part. This block has contraction joints at 10-meter intervals. The corewall and the slab under it, however, have no contraction joints. To minimize any tendency to open at the construction joints, these parts of the structure were made with low-heat cement, and the reinforcing bars pass through the joints.

The horizontal joint between the supporting cutoff block and the concrete corewall, in which the hinge movement take place, is closed by a steel plate, 12 in. wide and ½ in. thick, welded into a continuous strip across the entire dam. Asphalt sheets behind this plate lap over the joint and the



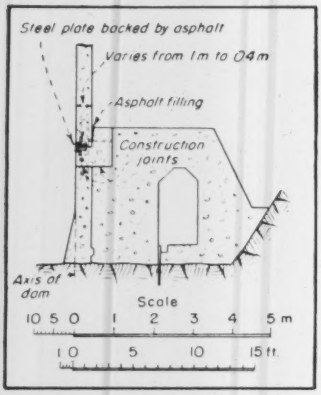
A THIN COREWALL of reinforced concrete and a narrow clay core were used to insure the watertightness of the rockfill dam.

THE TAILRACE TUNNEL from the underground power station—43 ft wide and 49 ft high—dwarfs the power shovels and trucks used in its excavation.

joint is filled with asphaltic material. The plate is bolted to the concrete on each side of the joint. Light vertical reinforcing passes through this joint.

To reduce friction between the corewall and the clay core that might result in arching action in the clay, the upstream face of the corewall is coated with asphalt. This also facilitates settlement in the clay.

• **Clay core**—The clay core extends into the rock in a trench generally 2 meters deep, which was carefully cleaned out, and all cracks were filled with concrete. Grout was pumped into holes 8 m and 3 m deep below this trench. As a further precaution, relief wells were driven into the rock back of the corewall at intervals of 1½ meter. Later they were extended up into the inspection gallery in the cutoff block.


Steel plate backed by asphalt
Varies from 1m to 0.4m
Asphalt filling
Construction joints
Axis of dam
Scale
10 5 0 1 2 3 4 5 m
1 0 5 10 15 ft.

A CONCRETE CUTOFF, large enough for inclusion of an inspection gallery, supports the corewall, which is hinged to it.

The clay core is 4 meters thick at the base and diminishes to 2 m at a point 20 m below water level in the reservoir, being uniformly 2 m thick above that point. That thickness was about the minimum that could be compacted properly with tractors. Moisture in the clay was kept as close as possible to that required for maximum density.

A filter consisting of vertical layers of sand, gravel and crushed rock was carried up through the dam between the clay core and the upstream rock fill to reduce the instrusion of fine material into the voids in the coarser fill. In the downstream side of the dam a similar filter of gravel and crushed stone was placed between the section built of moraine material and outer rock fill.

To reduce the risk of the clay core's suspension between the concrete corewall and the filter, thus forming passages through the clay, the rock fill in the upstream part of the dam was given less compaction than the same material in the downstream area. The latter was placed in rather thin layers and compacted by rolling or washing.

Gages for measuring the lateral pressure on the core wall have been installed in the dam and gages to measure settlement have been placed in both the upstream and downstream fills. Access to to those in the downstream fill is provided by several vertical wells formed with sections of concrete pipe.

• **Underground power station**—The power station is located in rock, 275 ft below the surface and almost directly under the left end of the dam, well removed from the fault zone. It is served by three vertical penstock shafts which are concrete lined to the level of the top of the machinery hall (about 200 ft) and steel lined below that point. The machinery hall is 330 ft long and 60 ft wide. Three generators of 96,000-kw capacity are being installed initially, with space at one end of the chamber for a fourth unit.

The turbines are set with the runner 2 m below ordinary downstream water level and about 1 meter above the lowest downstream level. Their draft tubes discharge into a single tailrace tunnel 1.8 miles long. The first 300 meters of this tunnel acts as a surge chamber. It is 43 ft wide and 72 ft high. The remainder has the same width, but the height is reduced to 49 ft. Using a single tunnel of this great size was considered economical as the rock was required for the dam.

The Harspranget hydro project is being built by the Swedish State Power Board. The information on which this account is based was supplied by G. Westerberg, chief director of the board's civil engineering department and K. J. P. Wittrock, chief engineer of the department.

Southern governor cites lower per-mile road costs

Lower costs per mile of highway construction were part of the "progress" report of Gov. Kerr Scott of North Carolina presented to the state legislature.

The governor reported more than 45% of the $200,000,000 rural secondary road building program outlined as an objective two years ago. Nearly 6,000 miles of new hard-surfacing have been added to the state's secondary road system.

The remainder of the program should be completed within the next two years unless work is interrupted.

Bonds to finance this project have been sold—in amount $125,000,000-worth—at "low" interest rates, with income earmarked for their retirement exceeding estimates.

Governor Scott warned that traffic increases were being made so rapidly as to make it necessary to revise plans in designing new highways. He urged provision of over- and underpasses, bypasses, and other highway construction in his report.

Smooth Steel Poles

a good investment for your city —from any angle

WHAT sort of an impression does your town make on the strangers who daily motor down its streets? Do they remember it as a modern, progressive looking city? Or did they get the impression that it was a pretty drab "burg" because its streets were still lined with ugly old-fashioned poles?

What the home folks think, is mighty important, too. Nothing will do more to boost their pride in the old home town than the replacement of obsolete, irregular poles with modern, good-looking tubular steel standards.

But an "up and coming" look is but one of the advantages you give your town through the adoption of steel standards for all street lighting, power lines, and other commercial pole purposes. And these other advantages (they're listed briefly in the column at the right) contribute just as much to the good reputation of a city.

In choosing new poles, you can make no better selection than NATIONAL Seamless Tubular Steel Poles. Every U·S·S NATIONAL Seamless Steel Pole is made by the seamless process . . . a solid billet of the finest quality steel is pierced to form the basic tube . . . there is no weld . . . no line of potential weakness . . . smooth, clean and trim looking. There's absolute uniform wall strength from end to end. For detailed information, write for Bulletin No. 14. Please address your requests to National Tube Company, Frick Bldg., Pittsburgh 19, Pa.

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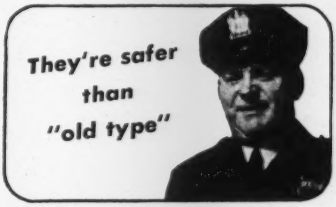
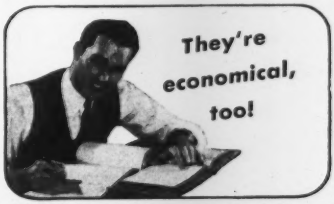
CITY MANAGERS know that the first things businesses look for when considering a new location are signs of a town's progressiveness. Streets lined with smooth steel poles say yours is a live place!

LEADERS OF WOMEN'S CLUBS recognize the importance of beautification programs. They know, too, that no improvement contributes more to a town's good appearance than the replacement of all unsightly poles with modern steel standards.



POLICEMEN see first hand just how hazardous many old types poles are. If they had their way, every pole would be a steel pole . . . and there would be fewer of them. NATIONAL Seamless Steel Poles can be spaced at wider intervals. And they offer less visual obstruction.



PURCHASING AGENTS say steel poles go farther because they can be spaced at wider intervals. Thus fewer poles are required for a complete replacement job. They're easy to rig and erect with minimum manpower, and except for an occasional paint job, require no maintenance.

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● The complete cylinder assembly is identical for *all* P&H Diesels — 1, 2, 3, 4 and 6 cylinder models. Replacements can be made in the field — from one engine to another — saving hours — even days on the job. Another good reason for standardizing on P&H Diesels. For literature, write Diesel Division, Harnischfeger Corporation, Port Washington, Wisconsin.
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BOOK REVIEWS

Elements of detailing

STRUCTURAL SHOP DRAFTING—Volume I. 200 pp. American Institute of Steel Construction, 101 Park Ave., New York 17, N. Y. $3.

To assist in the training of structural draftsmen, the Board of Directors of the American Institute of Steel Construction sponsored this textbook. There will be two volumes. The first covers riveted beam-and-column types of fabrication; the second, which may not be ready until next fall, deals with girders, trusses and more complex members, together with welded fabrication.

Vol. I was written for students with a knowledge of algebra and trigonometry but who may not have studied mechanical drawing. Therefore, it presents the technique of lettering, indicates proper weights of line, and outlines the principles of orthographic projection. Fabrication of structural steel is also described. And detailing of beams and columns is taken up in simple, progressive steps. The book may also be useful to engineers who wish to acquaint themselves with the latest shop drafting practices.

Conservation: water and land

WATER, LAND AND PEOPLE—By Bernard Frank and Anthony Netboy. 331 pp. Alfred A. Knopf, New York 22. $4.00.

THE WATER SEEKERS — By Remi A. Nadeau. 309 pp. Doubleday & Co., New York 20. $3.00.

WATER, LAND AND PEOPLE is a crusade—carried forward on well-marshalled evidence—to show that the United States must have a more realistic, broader approach to solving water problems. That approach, according to the competent-to-speak authors, is overall watershed management: Building of dams, levees and reservoirs too often unbalances nature. The forests and the fields must be taken into consideration; they must be kept healthy and alive to forestall economic loss by siltation of reservoirs, loss of topsoil and water wastage.

Here are a few gems of their thought:

"The watershed should be protected and used in such a manner as to maintain stability and health of soil, and therefore its ability to absorb water. This is the key to nearly all our water problems."

"In view of the problems dams have created, the wisdom of continuing our present methods and rate of river-harnessing may, in fact, be questioned."

"It is likely that future years will prove that proper land management with proper ground cover, plus (possibly) low dams but not high ones, will furnish us a better, more economical, more-permanent type of economy, better suited to our needs and in line with nature's own methods."

"Engineers are beginning to realize that we must look more and more to the land itself, and especially to complete integration of land and water use to solve our water problems."

"Construction is out-distancing comprehensive planning and is thus obligating the nation to heavy expenditures, which future generations may regard as in greater or lesser degree wasted."

THE WATER SEEKERS is a forceful story of the battle for water in the Southwest—in Southern California and Arizona. It is written in terms of some now-famous rugged personalities who made civil-engineering history: Fred Eaton, William Mulholland, A. P. Davis, E. C. LaRue, Frank Crowe, J. B. Lippincott, and Frank Weymouth. And it describes the fight to get Owens River water for Los Angeles, failure of the St. Francis Dam and construction of the Hoover Dam.

Essentials of plant design

PLANT LAYOUT AND MATERIALS HANDLING —By James M. Apple. 367 pp. The Ronald Press Co., New York. $5.

Here is a book that should prove valuable to plant engineers and designers of industrial buildings. It presents plant layout from an engineering standpoint, but without becoming too much involved in the technical features of equipment design and construction. Emphasis is placed on the major problem of essential coordination between plant layout, materials handling, methods engineering and production planning and control.

A feature of the book is its treatment of materials-handling equipment. The characteristics of most available types of equipment are presented and the considerations involved in the selection of the most suitable type for a given task outlined.

The author repeatedly calls attention to the interrelationship between production facilities and the building, as an important factor in layout. Structural considerations, for example, may affect choice of materials-handling equipment. Column spacing, lighting, heating, air conditioning, power supply and door sizes are only a few of the factors that influence placing of production equipment. Location of service facilities is another important consideration.

The author's treatment of building details, however, leaves much to be desired from a designer's viewpoint. Little assistance is offered as a guide to the selection of type of building, structural design, bay sizes, floors, walls and partitions, roofs, windows, painting or control of atmospheric conditions —all of which admittedly are important in planning a plant layout.

New Engineering Books

THEORY OF FLOW AND FRACTURE OF SOLIDS—By A. Nadai. 572 pp. McGraw-Hill Book Co., New York 18, and London. $10.00. *The price of this book was given erroneously as $1.00 in the issue of Nov. 16.*

TRAFFIC ENGINEERING HANDBOOK—Second Edition. 514 pp. Published by the Institute of Traffic Engineers and distributed by the Association of Casualty and Surety Companies, 60 John St., New York 7. $6.00

STRUCTURAL PLASTICS—By H. C. Engel, Charles B. Hemming and H. R. Merriman. 301 pp. McGraw-Hill Book Co., New York, Toronto and London. $4.50.

GEOLOGY AND FOUNDATION TREATMENT —Tennessee Valley Authority Projects —Technical Report No. 22. 548 pp. Treasurer's Office, Tennessee Valley Authority, Knoxville, Tenn. $2.00

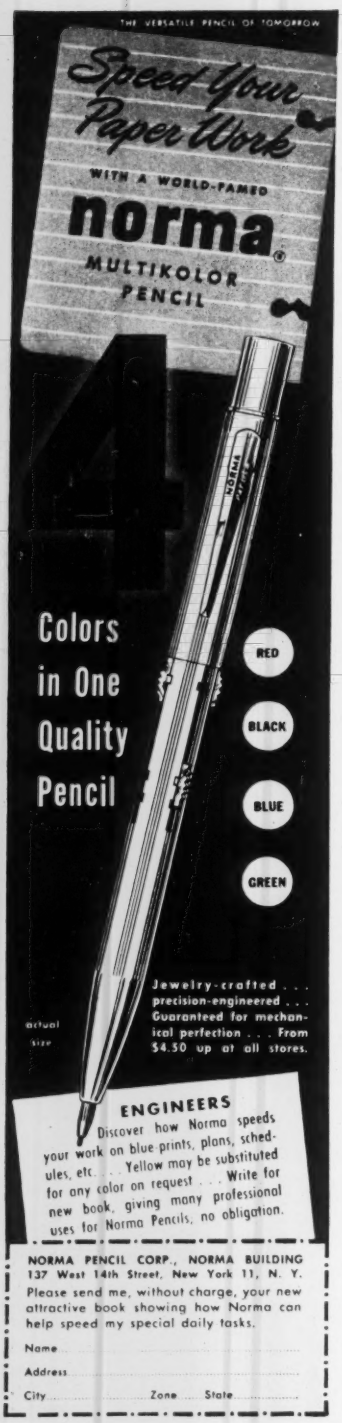
STRUCTURAL THEORY—Fourth Edition. By Hale Sutherland and Harry Lake Bowman. 394 pp. John Wiley & Sons, New York 16; Chapman & Hall, Ltd., London. $5.00

THE WAGE ADJUSTMENT BOARD—By John T. Dunlop and Arthur D. Hill. 166 pp. Harvard University Press, Cambridge 38, Mass. $3.50

PROCEDURE HANDBOOK OF ARC WELDING DESIGN AND PRACTICE—Ninth Edition. 1,200 pp. Lincoln Electric Co., 12818 Coit Road, Cleveland 1, Ohio. $2.00 in U.S.A.; $2.50 elsewhere.

TABLE OF THE BESSEL FUNCTIONS $Y_0(z)$ AND $Y_1(z)$ FOR COMPLEX ARGUMENTS —Prepared by the National Bureau of Standards. 427 pp. Columbia University Press, 2960 Broadway, New York 27. $7.50

SNOW MELTING—By T. Napier Adlam. 224 pp. The Industrial Press, 148 Lafayette St., New York 12. $4.50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READER COMMENT

Merger—Not Take-Over

Sir: In your issue of November 16, 1950 on page 29 you carried an article relative to the merger of the Carolina Road Builders with the Highway Contractors Division of the Carolinas Branch of the AGC.

We particularly desired to leave no impression that one organization was taking over another. At a local level the highway contractors felt it desirable to eliminate the duplicity of dues and services. It was also consensus that if all of the contractors were bound together at the state level one organization would be stronger.

By merging and maintaining the charter in the American Road Builders Association both National Organizations were recognized for the services rendered at the National level.

C. P. Ballenger, Jr.
Raleigh, N. C.

Steel Conservation

Sir: Raising the allowable unit stresses as a means of steel conservation as was done in the last war, cannot be supported by reference to the allowed stresses in aircraft design. Structural failures in flight were much more common before a 42% improvement of the structure weight percentage of the modern aircraft over pre War II designs was made. This was not achieved by raising allowed stresses, but by creating structural arrangements in which a planned redistribution of stress occurs gradually at increasing load until complete failure.

The thin sheets of aircraft buckle in visible waves regaining their original position upon relief from stress. Plate thicknesses permitting such behavior are not used in present day bridge and structural design. Tests of deep bridge girders have proved that thick webs buckle suddenly. They carry such an amount of stress that when it is instantaneously transferred the flange buckles also. Moreover, an inadaquate web stiffening system fails to prolong the buckling of a thick web to the extent indicated by computations.

Efficient use of steel in plate girders depends mainly on the web design. A thinner web alone represents the saving of a large percentage of the metal in the girder. Also a much lighter harness of stiffening system than that required to keep a thick web plate until it yields will hinder a thinner web from buckling until it reaches the yield stress.

Putting into the flanges the metal that can be saved by a good web design increases the carrying capacity of the girder not only by the moment corresponding to the increased flange section but also by the increased bending and torsional properties of the enlarged flange.

Examination of long-span plate girder bridges built in Germany before War II reveals: Their webs are thinner, their horizontal stiffeners stiffer, their flange sections larger, than specified, for instance, by AASHO(1949). This is true even in a greater degree for deep plate girder bridges built after the war.

Allowable unit stresses do not define the safety factor of structures unless other specification provisions assure the yield stress as the critical stress. True economy of structures results only from making the yield stress the critical stress by the use of the minimum amount of metal. Structural quality and economy are truly expressed only by the load carried per pound of metal before exceeding specified deflections.

The great structural efficiency of aircraft was achieved by full size testing of every imaginable arrangement, in detail as well as in complete assembly. The size of aircraft, the immense funds and lives expended, made this procedure possible. Although our national research expenditure for bridge and structural design is but a small fraction of that spent for aircraft, it is still the largest in the world—without useful results due to lack of guidance.

Waste of metal in truss bridge construction, likewise, is affected but little by the "low" stresses used in design. Uncomparably greater savings in the metal content of these structures can be achieved by advantageous layouts, types and members, than by simply raising allowed stresses. Shop welding, and experience with the corrosion resistance of metals in certain arrangements, can save 20% of the steel contained in long-span truss bridges built during recent years.

The use of advanced reinforced concrete structures is also an efficient way to save steel. This holds for bridges in a wide span range and especially for building construction. If there is not enough steel for necessary high-multistory buildings, the solution is not specifications lowering the quality of steel structures, but the modern reinforced concrete skyscraper, as demonstrated by South American examples (ENR Nov. 2, p. 26).

Louis Balog
Consulting Engineer
Binghamton, N. Y.

Torrington Bearings prove reliability in Lippmann jaw crushers

Never a bearing failure with proper maintenance—so report *Lippmann* engineers of Torrington Roller Bearings used in *Lippmann* Grizzly King Jaw Crushers. This service record has been earned in the toughest applications, like the 36 x 48 Grizzly King at the Pelham, Ala., plant of McCullough Industries.

Day-in and day-out, Torrington Roller Bearings help *Lippmann* Crushers handle high production schedules. These precision bearings provide line contact for maximum capacity. Heavy radial and thrust loads developed in continuous operation are handled with ease.

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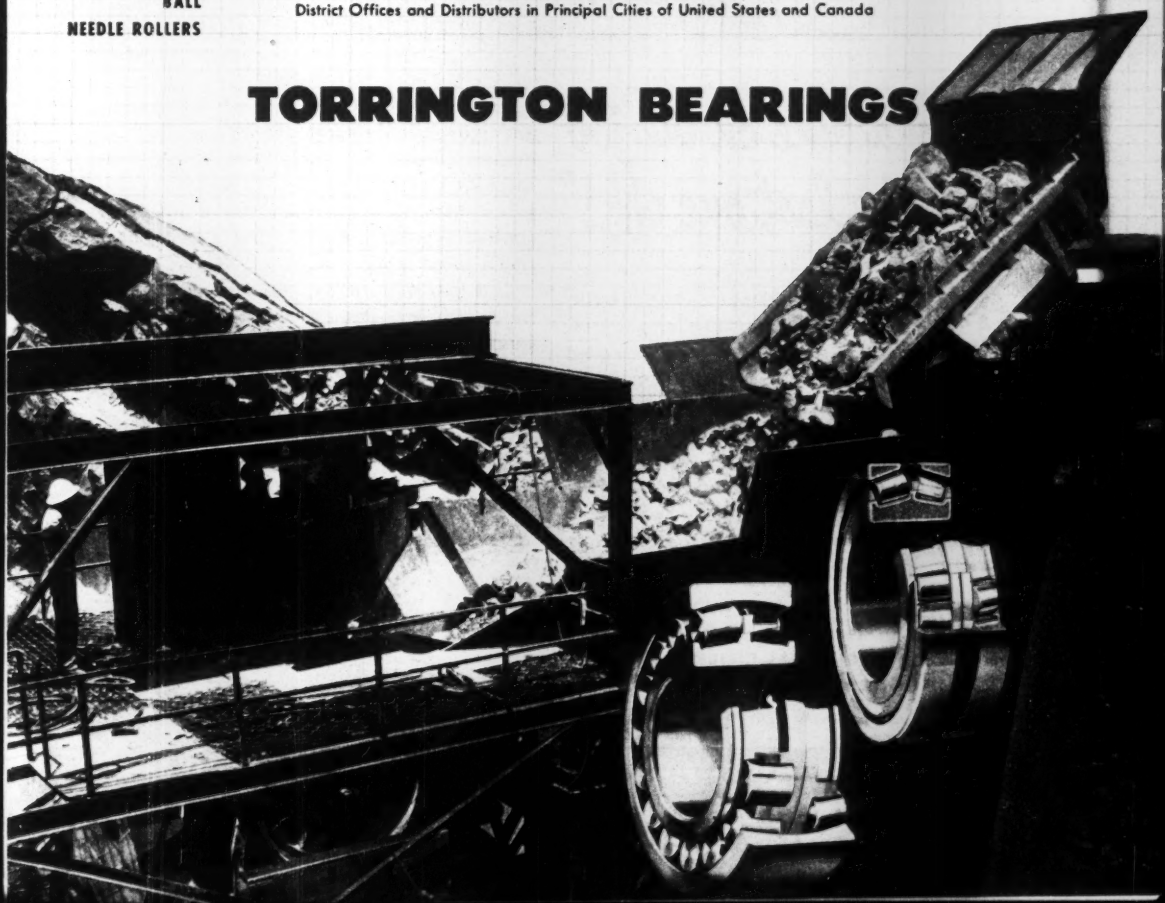

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THAT'S WHAT A GRADALL OPERATOR for the Latrobe Construction Company of Latrobe, Pa. has to say about this amazing multi-purpose construction machine.

On this particular job—road construction at the Irwin Interchange on the Pennsylvania Turnpike—the Gradall was used for grading banks, digging ditches, rooting up concrete and sub-grading the highway. Best of all, it eliminated the hand work by sub-grading right up to the form.

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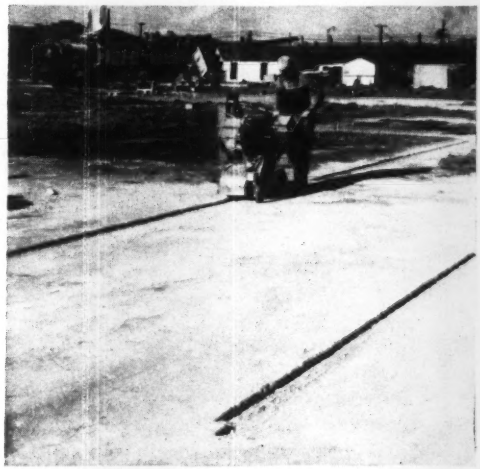
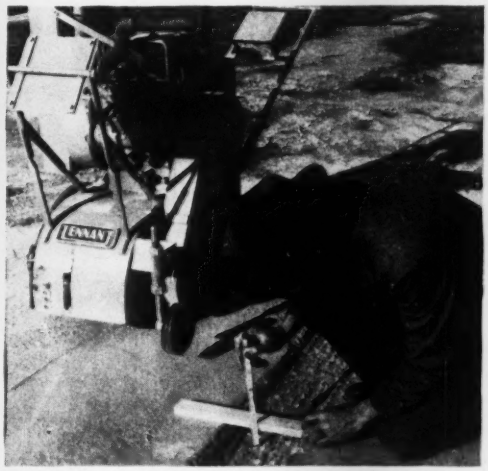




CONDUIT TROUGHS are cut in green concrete floor . . . . . by a power grinder that cuts 2 in. deep.

Machine cuts conduit grooves after slab is poured

Installation of electrical and compressed air conduits in a concrete floor slab by a different way has been demonstrated by a Chicago contractor. Instead of trying to form them when placing the concrete, or cutting them with conventional jackhammers and pavement breakers, the contractor poured the slab full depth; then cut troughs while the concrete was still green.

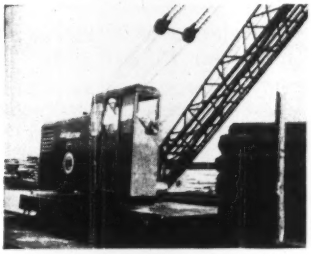
The job involved providing 1,500 lin ft of troughs measuring 6 to 12 in. wide and 2 in. deep, in a 7-in. concrete floor slab for a one-story printing press building. Total floor area is 163,000 sq. ft.

After the ½-in. and 1-in. conduits are laid in the troughs, the troughs are filled with sand-cement grout flush with the top of the slab. The entire area is then covered with creosote-treated end-grain wood-block flooring. Troughs are cut within 8 days of pouring. Concrete is placed directly on the subgrade with a concrete paver.

The power grinder, manufactured by the G. H. Tennant Co., Minneapolis, Minn., is similar in operation to the one used by the Iowa State Highway Commission for grinding off the lips of pavement to be widened (ENR, Oct 19, 1950, p. 42). It is hand propelled, with the cutting action of the grinders providing some forward motion. A 13.3-hp gasoline motor and V-belt drive turn the cutters at 2,400 rpm, cutting to the full 2-in. depth at each pass. There are four 4¾-in. cutters mounted on each of six bars, staggered. They make a 4-in. wide cut.

Specifications call for an air-entraining concrete with limestone aggregate, having a minimum 28-day strength of 3,000 psi. Average strength of concrete, however, is 3,400 psi. The concrete is not vibrated.

The plant is being built for the Goss Printing Press Co., by Sherman Olson, Inc., Chicago. Ernie Olson is construction superintendent. Olsen & Urbain, Chicago, are the architects; and Neiler, Rich & Bladen, Chicago, are consultants on the mechanical engineering.



Plexiglas dome cuts glare

Dome section of green Plexiglas in the front quarter of the cab roof is contributing to efficiency, safety, and comfort in the operation of diesel-electric cranes made by the American Hoist & Derrick Co. The transparent plastic provides full visibility upward as well as to front and sides while shielding the operator from sun glare, enabling him to watch the boom's movements without eyestrain. The dome has the additional advantage of resistance to breakage.

Roof sections are formed from single sheets of ¼-in.-thick, green, transparent Plexiglas. Lugs cemented on the inside of the roof facilitate clamping formed sections to the cab. Double-channel rubber pinch molding is used to provide a weather-tight seal between the plastic sheet and the steel panels of the cab. The acrylic plastic sections are formed by Plastics, Inc., of St. Paul, Minn. Plexiglas is a product of Rohm & Haas Co.

ANY SUGGESTIONS?

We would like to hear of interesting new devices and methods devised by our readers to speed up and simplify field work; or of new techniques intended to simplify design computations. We will pay for published items, so send your suggestions to ENR's Field and Office Editor at 330 W. 42nd St., New York 18, N. Y.

Foundations of Structures

Just Out

1. **Here are sound instructions on every phase of foundation engineering**—from how to gather and interpret soil data, and how to plan the support of a structure, to how to handle the construction of that foundation. Describes all types of foundations, **and gives examples of some actual substructures. By Clarence W. Dunham, Professor of Civil Engin., Yale U. 669 pages, 464 illus., $7.50**

Handbook of Rigging

2. **Condensed into this one book are all the tips, methods and techniques essential to more effective rigging practices** in industrial and construction operations. Deals with everyday maintenance operations—with the transportation and handling of heavy machinery — with the erection and demolition of smaller size structures. **By W. Rossnagel, 321 pages, over 300 illus., $4.75**

House Construction Costs

3. **How to determine unit costs of house construction—a simplified method applying to all designs and local price variations.** Includes data on quantity of material and number of labor hours needed, and gives worked-out examples of typical unit costs. **By G. Underwood, 302 pages, 63 illus., $4.75**

Civil Engineering Handbook

4. **New Third Edition covers fundamentals, theory, and practice of the various subdivisions of civil engineering.** Ten big sections discuss everything from city surveying and stress in beams, through bridge trusses and welding and riveting, to pile foundations and intakes and dams. **Editor-in-Chief, Leonard C. Urquhart, Consulting Engineer, New York, N. Y., and Newark, N. J.; Former Colonel, Corps of Engineers, and Professor of Structural Engineering, Cornell Univ. 976 pages, over 900 illustrations, tables, and diagrams, semi-flexible cover, $8.50**

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MUNICIPAL AFFAIRS

THE HAWKEYE STATE CAPITOL stands on the hill at the far end of Locust Street as shown in this aerial photograph. The site of one of the city-owned parking garages is Locust and Fourth Streets.

Des Moines has a practical plan for off-street parking

Des Moines, Iowa, like every other American city, has found the lack of parking space in its downtown area a growing problem, but, unlike some other cities, it is really doing something about it, because it is the capital, the largest city, and the leading retail, wholesale and manufacturing center of the state of Iowa, which has more than a million motor cars.

In brief, the plan is municipally-financed through a $1,250,000 bond issue to be retired over a 19-year period with revenues from garages, parking meters, and if necessary, a one-half mill tax levy. State legislation was obtained providing for the setting aside of 75 percent of parking meter income, after meters are paid for, to be used by the city for off-street parking—the other 25 percent to be used for maintenance, repairs, collection, and traffic rules enforcement. A law was also passed providing that the city council (when shown that there is a need for such off-street parking) may issue bonds and provide for a one-half mill assessment on all taxable property in the city.

The city sold $1,250,000 of parking lot fund bonds and went ahead with the erection of a conventional type of garage using ramps on five levels, accommodating 350 cars; and also a 9-story elevator type of parking building to provide space for 450 cars.

Des Moines, on the Des Moines River, is 105 years old. Its altitude is 861 ft, and its area is 56 sq. mi. The population of its metropolitan area is given as 224,920. It is one of the first cities in the United States to plan on a generous scale for beauty in its development. A comprehensive city plan was adopted in 1924 and is being carried out as far as possible. About half of the people of Des Moines own their own homes. The city is now in the midst of its greatest housing development made necessary by increased industrial growth.

Citizens' faith in the future of Des Moines is demonstrated by the fact that voters have authorized expenditure of $5,250,000 for a new auditorium to seat more than 14,000 people.

Complete traffic survey made for Albuquerque

Typical of the work done under a federal-aid advance engineering project is the traffic survey made for Albuquerque, N. M., by the Automotive Safety Foundation under D. Grant Mickle, director of the Traffic Engineering Division, and financed by the city, state, and the U. S. Bureau of Public Roads and the Department of Commerce.

The imperative necessity for such a survey is indicated by the fact that while it took Albuquerque 234 years to become a city of 35,000 population,

only the last 10 years were required to bring the population up to 97,012.

The survey took about a year to make, and it is very completely outlined in a 96-page, illustrated brochure presented as a report to the city of Albuquerque and the New Mexico State Highway Commission. Its basic recommendations include suggestions on a model traffic ordinance, traffic engineering, an arterial system, parking, truck operations, public transit, traffic safety, zoning and enforcement.

The book is recommended for study by the many municipal and traffic officials confronted by similar problems.

Municipal Briefs

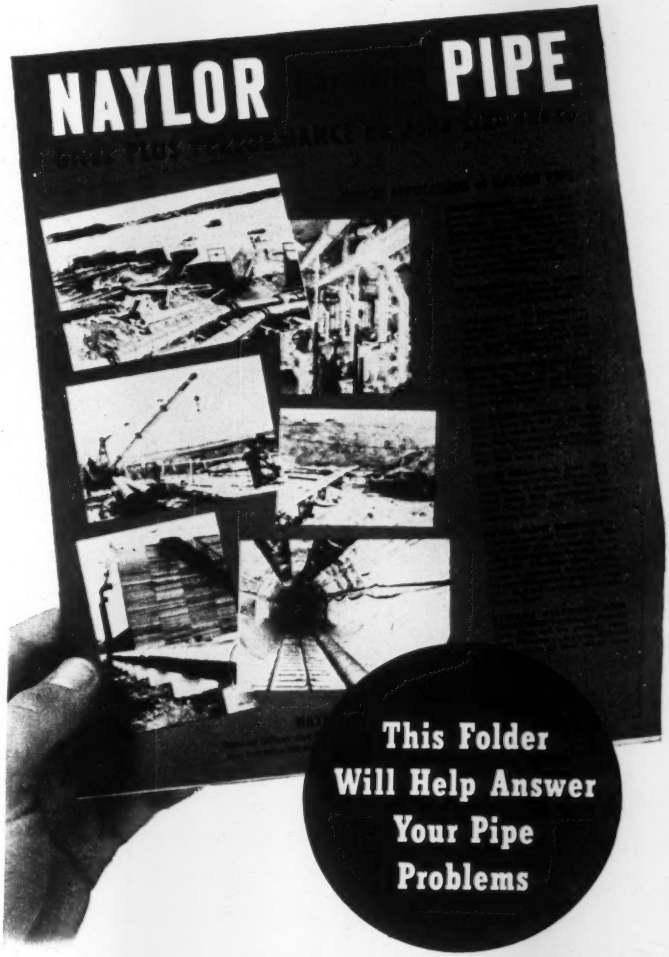
Branch city halls—According to the American Society of Planning Officials, the Los Angeles planning commission has made a study as the result of which it recommends decentralized municipal services by providing 12 branch administrative centers scattered throughout that city's area of 435 sq. mi.

Kansas City sewage works—An advance of $73,740 to assist Kansas City, Kan. in the making of an engineering study and report preliminary to the preparation of detailed plans and specifications for construction of sewage collection and treatment facilities to cost an estimated $6,231,500, has been approved by Administrator Raymond M. Foley of the Housing and Home Finance Agency.

Bridge over bottlenecks—Lansing, Mich., is talking plans for a superspan to relieve east-west traffic. A bridge to span Grand River at Ottawa Street and over a five-block area seems to offer a remedy for bottlenecks and traffic snarls. Potentially it will connect with Jerome Street at Hosmer Street. Such a bridge would cost around $1,500,000 and must follow completion of the Main Street Bridge program.

Binghamton traffic study—The possibility of having the tangled traffic of Binghamton, N. Y., studied by a traffic expert is suggested by Mayor Donald W. Kramer. He has decided that the street pattern in downtown Binghamton is so irregular that only an expert could offer a traffic solution.

Baltimore expressway—Mayor Thomas D'Alesandro, of Baltimore, Md., plans to ask voters in the mayoralty election next May to approve a $10,000,000 bond issue for a start on the construction of the 6-mile Jones Falls expressway. The city planning department has estimated that the super road from the north city line to Chase St. will cost upwards of $25,000,000.



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MEN AND JOBS

Shown above are some of the North Carolina city officials and planners who attended a recent conference on urban redevelopment sponsored at Chapel Hill by the Department of City and Regional Planning of the University of North Carolina. Left to right, are: William Lundquist, assistant director, and Ronald Scott, director of planning, for Greensboro; Henry Moore, director of planning, Winston-Salem; Malcolm Little, director of planning, High Point; C. E. Perkins, city manager, Winston-Salem; William Carper, city manager, Raleigh; J. R. Townsend, city manager, Greensboro; Frank Dieter, director of planning, Durham; Herbert Stevens, director of planning, Raleigh; and Robert W. Flack, city manager, Durham.

W. G. Sloan, 62, Billings, Mont., co-author of the Pick-Sloan plan for the Missouri River basin, is retiring and has been awarded the Department of the Interior gold medal for distinguished service. He was the author of the original Sloan plan later consolidated with that of the Army Corps of Engineers to become the Pick-Sloan plan authorized by Congress in the Flood Control Act of 1944. Mr. Sloan took his civil engineering degree at Montana State College in 1910, and the next year he was appointed drainage engineer of the Department of Agriculture at Boise, Idaho. He served with the 29th Engineers in the first world war. His first major assignment with the Bureau of Reclamation was in 1936 in charge of the Rio Grande joint investigations in Colorado and New Mexico. Then he was placed in charge of investigations of projects and river basins in Idaho, Montana, Wyoming, North and South Dakota, and Nebraska This resulted in preparation of the coordinated departmental plan for the development of the Missouri River basin.

E. C. Warsaw has formed the Warsaw Construction Co. at Warsaw, Ind., to specialize in excavation, land clearing, grading and leveling. He resigned as plant engineer-manager for the MacAllister Machinery Co. He was formerly with Caterpillar Tractor Co., served as proving ground and service engineer in Newfoundland and South America, and as general foreman at the Decatur, Ill., plant.

George Johnson who resigned as general manager of the Central Nebraska (Tri-County) Public Power and Irrigation District in 1947 has been rehired as chief engineer by the board of directors at Hastings, Neb.

Pecos H. Calahan, executive secretary of the California Board of Examiners for Civil and Professional Engineers, has retired to be replaced by **William A. White,** his executive assistant. Calahan, who has held his post for 21 years, formerly was a practicing engineer in Southern California.

Ronald McIsaac, for the last 23 years division engineer for the Canadian National Railways at New Glasgow, N. S., has retired. For the last 44 years he has been in railroad engineering work.

Maj. Gen. H. A. Young, civil engineer vice-president of Central Mortgage and Housing Corp., has been appointed Deputy Minister of the Canadian Department of Resources and Development.

J. S. Harrison, former city engineer and city manager at Morton, Tex., has become city engineer of Bryan, Tex. He succeeds J. M. Orman who has been made Public Works Director at Midland, Tex.

Roy N. Brodie, Boston, Mass., assistant structural engineer for the Boston & Maine Railroad for the last six years, has been promoted to engineer of structures for the Boston and Maine and the Maine Central railroads, and the Portland Terminal Co. He suc-

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ceeds **Benjamin W. Guppy. Thomas K. Dyer,** of Medford, project engineer, succeeds Mr. Brodie as assistant structural engineer.

G. T. McClean, long city engineer at Astoria, Ore., has resigned and will engage in limited private practice as consultant. With the exception of time served in World War I, and five years thereafter, he has been with the Astoria city engineering staff since 1915. Harold Olsvict has been advanced from assistant city engineer.

William Weston has been appointed assistant director of the South Carolina State Board of Health's division of sanitary engineering. He has been with the board for 30 years as a sanitary engineer.

Capt. Walter R. Hylander, Jr., is assistant district engineer in the Vicksburg, Miss., district. He received his master's degree in engineering at Massachusetts Institute of Technology last June, and has spent the last six months in the field.

Wilfred L. Karrer, construction engineer for the Bureau of Reclamation on the Lewiston Orchards project in Idaho since 1947, has been transferred to a similar position on the Yakima project in eastern Washington. His major immediate job will be to supervise advance planning activities on the 21,000-acre Kennewick division of the Yakima project and also to supervise rehabilitation work on Tieton, Kachess, Bumping and Keechelus dams. Karrer joined the Bureau as a transitman on the Owyhee project in Oregon in 1929 after graduation in engineering from the University of California. Nine years later he transferred to the Chief Engineer's office in Denver as associate engineer. He became engineer on Anderson Ranch Dam of the Boise project in 1941, served in the Navy during the war and returned to the bureau as regional engineer in the Pacific Northwest.

Lt. Col. Geo. F. Dixon, Jr., who has been executive officer and assistant district engineer at Vicksburg, Miss., has become acting district engineer. He received his doctorate in hydraulic engineering at Grenoble University, France, in 1949.

Philip H. Carlin is in charge of the specifications department of Harley, Ellington & Day, Detroit, Mich.

Lt. Col. A. H. Lahlum has been appointed assistant district engineer and chief of the Snow, Ice and Permafrost Research Establishment, St. Paul, Minn., district, Corps of Engineers.

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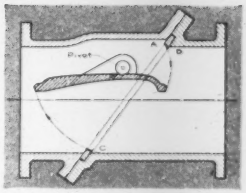

Cross-section of the Chapman Tilting-Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

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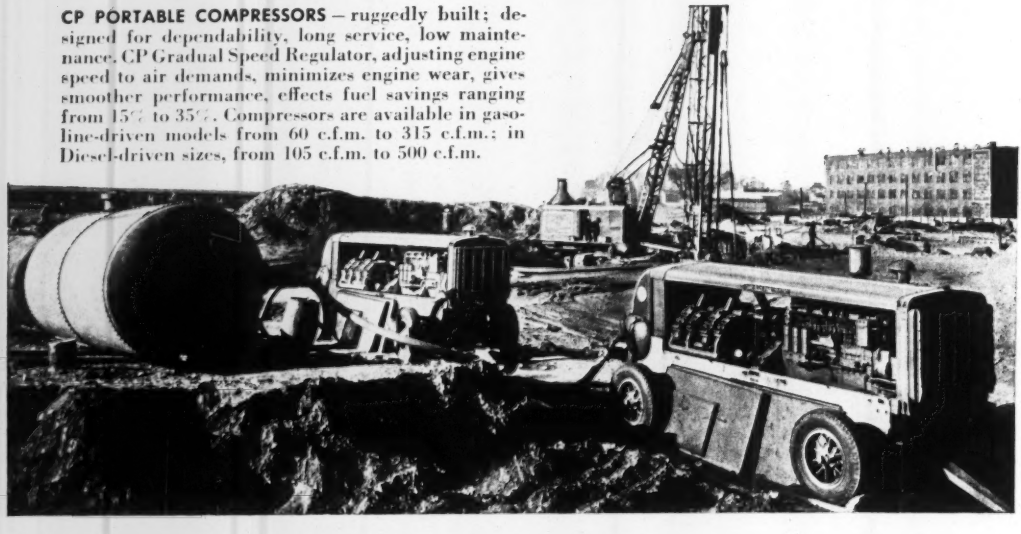

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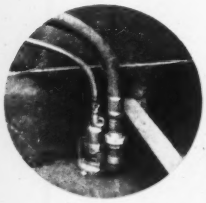

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EDUCATION and RESEARCH

Educational Notes

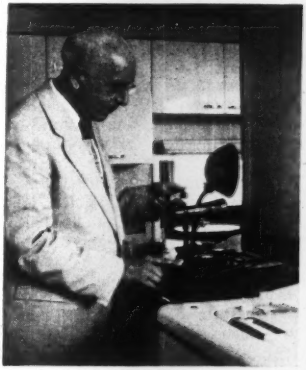
Project plan—At the college of engineering, Cornell University, a new engineering project plan, emphasizing student ingenuity and initiative has been inaugurated. Each student is required to complete an individual problem of specific research as part of his final year's research in the 5-year undergraduate curriculum.

Traffic engineering—Sponsored by the Rand McNally Co., a fellowship in traffic engineering has been established at Yale University. It is to be awarded annually on a competitive basis to an engineer employed by a city or state highway department. Its $1,400 stipend will apply to a year of graduate study in the Yale Bureau of Highway Traffic.

Small house consulting service—A small house consulting service, consisting of a panel of registered architects, organized to assist the public on any problem connected with buying, building or remodeling a home has been started by the N. Y. Chapter of the American Institute of Architects. There are 28 members of the panel, all of them are experienced in small-house building.

Water and sewage films—The Water and Sewage Works Manufacturers Association, Inc., is interested in the distribution of motion picture films of interest to water works, sewage works and other engineering and chemistry groups. Among the titles are: "Installing Cast Iron Pipe"—handling, installation, testing and chlorinating cast iron pipe lines; "As the Gentle Rain"—nature's cycle of water and the man-made cycle of water supply from surface sources; "Environmental Sanitation"—covers sanitary facilities and practices necessary to protect health and lives of people in crowded cities; "Design and Construction of a Water Collection and Transmission System"; and "The Ominous Arms Case", a case history of back siphonage and pollution of water. Further information available from the association's office at 170 Broadway, New York 7, N. Y.

Builder honored—Henry C. Ulen, Lebanon, Ind., a builder of public works during the last half century, was honored recently at Purdue University, when he was presented with a plaque bearing the university seal and the statement, "Builder of international good will and sound structures."



REFLECTED HEAT—Clarence A. Mills, University of Cincinnati professor, is making researches on reflected heat. He has a 7-room, one-story house which has no conventional insulation, and no conventional heating or air-conditioning devices, and yet it is a comfortable house in summer or winter. Around the top of the walls is an aluminum trough containing cooling coils for summer, and within the trough is a smaller one carrying electric heating elements for winter. Walls and ceilings are covered with aluminum foil, floor with foam rubber mat and nylon carpet. Using a lamp, Dr. Mills is shown measuring intensity of rays from a sheet of aluminum wallpaper.—Wide World photo

RESEARCH DIRECTOR—Nicol H. Smith has been appointed executive director of The Franklin Institute laboratories for research and development, at Philadelphia, Pa. A graduate of the University of Pennsylvania, early in World War II Dr. Smith was placed in charge of research work undertaken by Franklin Institute for the federal government. He was awarded the Presidential Certificate of Merit for his services from 1942 to 1945 as senior technical aide to the Division of Ballistic Research, Office of Scientific Research and Development.

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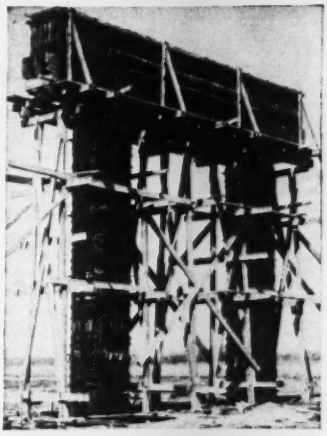

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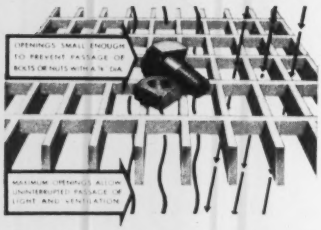
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MEETINGS

Karl F. Hoefle of Dallas, Tex., has been elected chairman of the Southwest section, American Water Works Association. He is superintendent of the Dallas water department. Other officers: Henry Wilkens, Jr., Houston, vice-chairman: and Edward R. Stapley, Stillwater, Okla., Southwest section director of the National AWWA. Trustees are Foster Burba, Stillwater, Okla., L. M. Welch, Lake Charles, La., Edward F. O'Fallin, Forrest City, Ark., and Robert Thompson, San Antonio, Tex.

Officers and directors of the American Institute of Steel Construction have been elected as follows: President: R. D. Wood, Mississippi Valley Structural Steel Co., Chicago; first vice-president: J. E. Jackson, Pittsburgh-Des Moines Steel Co., Pittsburgh; second vice-president: J. Philip Murphy, Judson Pacific-Murphy Corp., Emeryville, Calif.; executive vice-president: L. Abbett Post, New York, N. Y.; treasurer: James M. Stroub, Fort Pitt Bridge Works, Pittsburgh, secretary: M. Harvey Smedley, New York, N. Y. Four new directors: R. N. Allen, Star Iron & Steel Co., Tacoma, Wash. L. J. Knapp, Whitehead & Kales Co., Detroit, Mich. Earl A. Jung, August Feine & Sons Co., Buffalo, N. Y., and F. E. Owen, Paxton & Vierling Iron Works, Omaha, Neb.

Neal D. McDowell, district planning and bridge engineer, Bureau of Public Roads, has been elected first president of the recently chartered Maine Section, American Society of Civil Engineers, which has a membership of nearly 100. It elected Hamilton Gray, civil engineering department, University of Maine, as vice-president. Other officers: Vaughn M. Daggett, assistant chief engineer, Maine Highway Commission, secretary and Hugh D. Chase, engineer, State Planning Survey, treasurer. The group will sponsor annual highway conferences, the first of which is being planned for this winter under the chairmanship of Hamilton Gray. A sanitary engineering session is also scheduled. Elmer W. Campbell, director, State Division of Sanitary Engineering, is program chairman.

Raymond F. Dawson, professor, and director of research, University of Texas, has been elected president of the Texas section, American Society of Civil Engineers, succeeding L. D. Snow. Frank H. Newman, Houston, was elected vice-president, succeeding F. M. Davis of Paris, and Robert L. Lowery of El Paso was also chosen a vice-president, succeeding S. R. Wright of College Station. I. W. Santry, Jr. of Dallas, professor at Southern Methodist University, was re-elected secretary-treasurer.

T. E. Fieweger, vice-president of the Central Engineering Co. of Davenport, Iowa, was elected president of the Associated General Contractors of Illinois, succeeding William H. Kewley, Springfield, secretary-treasurer of Sangamo Construction Co. J. F. Gallagher, president of the Gallagher Asphalt Co. of Thornton, Ill., was elected vice-president, succeeding N. R. Jansen, of Pekin. Thomas H. Joyce, Jr., of Joyce Brothers Contracting Co. of Springfield, was re-elected treasurer.

Executive council of the Texas Associated General Contractors has elected: Fred Fisher, Houston, chairman; F. S. Oldt, Dallas, vice-chairman; and Lloyd W. Duddleston, Houston, secretary. The council opposes proposed legislation that would require contractors to be licensed like lawyers and doctors.

CALENDAR

N. Y. Sewage & Industrial Wastes Association, Hotel Statler, N. Y. City, Jan. 19-20.
National Association of Home Builders, annual convention and exposition, Stevens and Congress Hotels, Chicago, Ill., Jan. 21-25.
Conference, Wisconsin County Highway Commissioners and County Highway Committee Members Association Milwaukee, Wis., Jan. 23-25.
Third California Conference on Street and Highway Problems, University of California, Berkeley, Jan. 24-26.
Associated Equipment Distributors, annual meeting, Stevens Hotel, Chicago, Ill., Jan. 28-Feb. 1.
Association of Asphalt Paving Technologists, Cosmopolitan Hotel, Denver, Colo., Feb. 5-7.
N. J. Section, AWWA, luncheon meeting, Hotel Essex House, Newark, N. J., Feb. 14.
Midwinter Housing Conference, S. W. Research Institute's division of Housing and Construction Technology, Statler Hotel, Washington, D. C., Feb. 13-14.
Illinois Annual Conference on Highway Engineering, Urbana, Ill., Feb. 20-22.
American Concrete Institute, St. Francis Hotel, San Francisco, Calif., Feb. 20-24.
Industrial Waste Conference, Purdue University, La Fayette, Ind., Feb. 21-23.
American Society of Civil Engineers, convention, Rice Hotel, Houston, Texas, Feb. 21-23.
Midwest conference, Building Officials and Inspectors, Purdue University, La Fayette, Ind., Feb. 26-28.
American Concrete Pipe Association, Waldorf-Astoria Hotel, New York City, March 1-3.
American Road Builders Association, Schroeder Hotel, Milwaukee, Wis., March 12-14.
American Railway Engineering Association, Chicago, Ill., March 13-15.
N. J. Sewage and Industrial Wastes Association, Haddon Hall Hotel, Atlantic City, N. J., March 14-16.
N. Y. State Association of Highway Engineers, Rochester, N. Y., March 28-30.
N. J. Society of Professional Engineers, Haddon Hall, Atlantic City, N. J., Apr. 6-7.

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...Placed in the 2½ Years Since its Introduction

EASY APPLICATION of Kaylo Insulating Roof Tile expedites the completion of flat or pitched roofs. Standard roofing materials are used over a Kaylo roof deck.

Kaylo Insulating Roof Tile is selected for more and more buildings of all kinds because it offers a combination of advantages unmatched by any other roof deck material:

Incombustibility of Kaylo Tile assures protection against fire;

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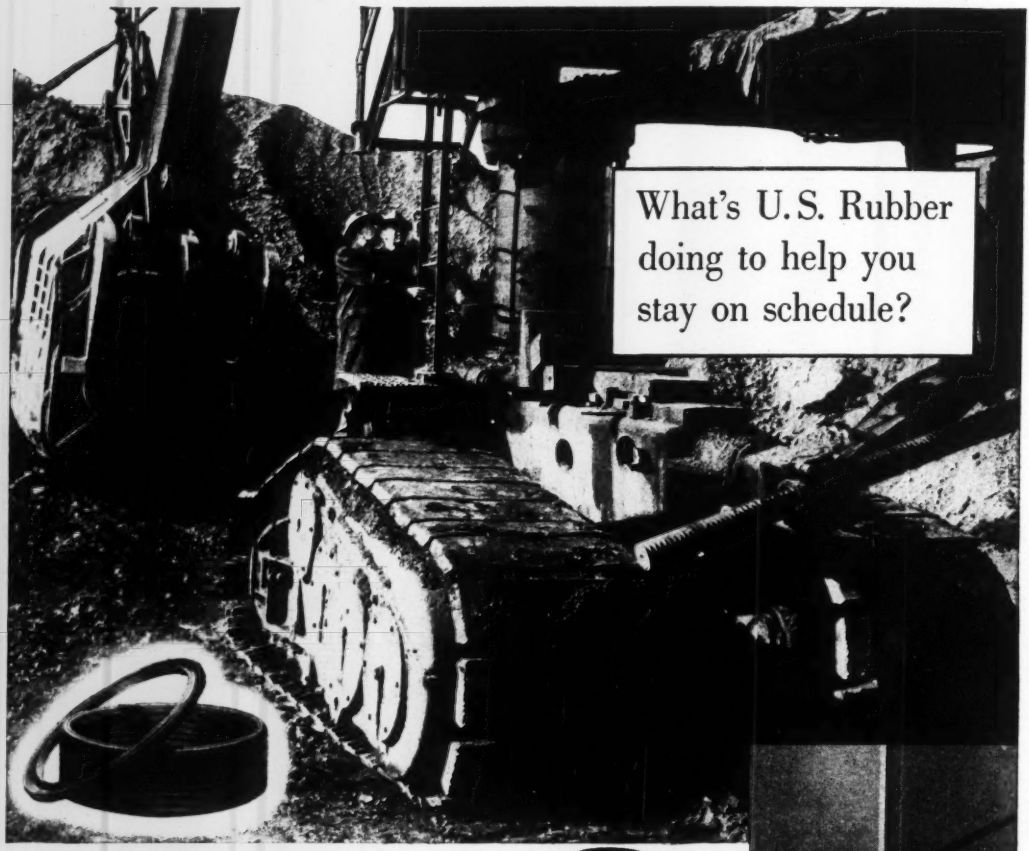

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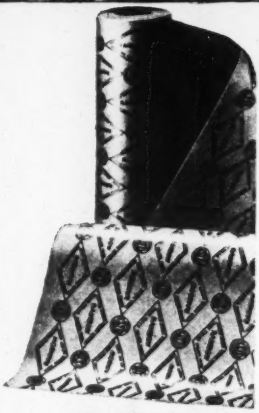

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OBITUARY

Brig. Gen. William Preston, 77, retired Army Corps of Engineer officer and former editor of its official publication, died at Washington D. C., Dec. 13. He was graduated from West Point in 1908 and was commissioned a second lieutenant in the Corps of Engineers, serving in the Philippines in the Spanish-American War. Subsequently he was stationed at various posts in Hawaii and in the United States. During World War II, he commanded the 14th Engineer Regiment in France and shortly before the armistice was appointed chief engineer of the Third Army. He was in charge of the initial survey of the St. Lawrence River to prove it navigable for ocean-going vessels, and at the time of his retirement in 1930 was in charge of levee construction and flood control on the lower Mississippi River.

Edwin F. Codington, 80, Columbus, Ohio, professor emeritus of civil engineering at Ohio State University, and an outstanding mathematician, died Dec. 21. He was successively professor of mathematics, mechanics, geodetic surveying and acting dean of the college of engineering at Ohio State, having retired in 1940. Continuing to do research, he was consultant to the Mapping and Charting Research Laboratory of the Engineering Experiment Station. He was graduated in civil engineering at Ohio State in 1890 and received his Ph.D. in astronomy from the University of Berlin in 1902.

Raymond F. Fletcher, 49, a design engineer in the engineering department of E. I. du Pont de Nemours and Co., Wilmington, Del., died on Dec. 26 at Wilmington. He had been with the company about 16 years.

John J. Johnson, 48, regional construction engineer for the State Road Commission of West Virginia and a member of the engineering staff of the commission for the last 22 years, died Dec. 24, at Charleston. He was graduated from Marshall College in 1928. He was employed by the U. S. Engineers, Huntington division, for a short time.

Charles H. Lord, 61, city engineer of Ogdensburg, N. Y., for the last 32 years, died Dec. 28. He received his degree in civil engineering from Cornell University in 1912. He represented the third generation of his family to supervise the water system of Ogdensburg. He was appointed city water superintendent in 1918 and also was made city engineer in 1926. In 1936 he was named to the Oswegatchie River Commission.

William D. Roberts, 69, civil engineer of Seattle, Wash., died Dec. 27. He had lived in Seattle since 1907, except for service in the Army during World War I. He had worked in the King County Engineer's office and, since 1934, with the firm of Morford & Mowry.

E. G. Edwards, 58, who had been a construction superintendent for the Hoover Dam project and who also had done paving work in Cuba, died at Charlottesville, Va., Dec. 7.

John G. Hartley, 74, assistant engineer in the office of the chief engineer of the Pennsylvania Railroad from 1930 to his retirement in 1947, died at Wayne, Pa., Jan. 3. He had served with the railroad for 45 years.

Louis C. Sabin, 83, formerly vice-president of the Lake Carriers Association and for whom a 1350-ft lock at Sault Ste. Marie, Mich., was named in recognition of his part in engineering the project, died Dec. 30 in Cleveland Heights, Ohio. Early in his career Mr. Sabin was a civil engineering graduate of the University of Michigan, and as a civilian was in the employ of the United States Army Engineers. From 1906 to 1925 he was general superintendent of the "Soo" canal.

Forrest R. Hughes, 57, associate professor and assistant dean of the Yale University school of engineering, died at New Haven, Conn., Jan. 5. He was a civil engineering graduate of the University of Missouri. He served with the Army Engineers in the first world war and in the second he supervised the training of more than 15,000 defense workers under Yale's engineering, science and management training program.

Arlington A. Joseph, 64, chief engineer in charge of inspection on the new hydroelectric power plant at Sault St. Marie, Mich., died Jan. 4. He was a 1909 graduate of Ohio Northern University. He was a civilian engineer with the Corps of Engineers on construction of the Davis and Sabin locks at the Soo. In 1942, he supervised construction of the Mac Arthur locks and the compensating gate across the rapids.

Edward J. Kearns, 51, Indianapolis, Ind., of the Edward J. Kearns Construction Co., died Dec. 31. He was a graduate of the University of Illinois, and during World War II was a major in the Army Engineering Corps.

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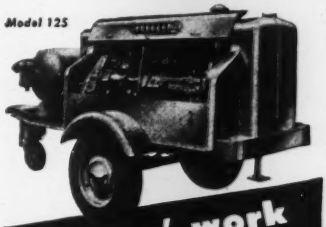

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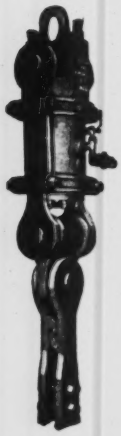
And what results! On any pile extracting project, anywhere, a Vulcan will do the job exactly the way good contractors want it done. That's been proved in the field time and time again under the most adverse conditions.



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UNIT PRICES BID BY CONTRACTORS

Water supply line for Springfield, Ill.

Bids from eight firms on an auxiliary water supply trunk line from Lake Springfield to the city were wide apart. The low bid of $137,898.10, submitted to the City of Springfield, Ill., on Nov. 14, 1950, was 30% below the second low bid and 78.2% below the high. Crawford, Murphy and Tilly are consulting engineers.

The job involves installation of about 3½ miles of a 36-inch cast iron water main for the first section of a new supply line from the lake to the business district supplementing two existing mains, one 24-inch and one 30-inch. The contractor must remove the pavement, construct and maintain all bridges for traffic control and provide barricades, guards and warning lights. The work must be completed in 120 days.

The city is furnishing all Class B bell and spigot pipe in 16-foot lengths and fittings; gate and check valves; valve boxes; jute for yarning and packing joints; lead, in pigs from 50 to 100 pounds each; and fire hydrants. There are several railroad sidings within quarter of a mile of the job site.

Wage rates prevailing are $2.50 an hour for skilled labor, $1.75 for common labor.

Bidders included:

1 R. J. Hastings & L. J. Stiers, St. Louis, Mo. (contract) $137,898.10
2 W. L. Hall, Atwood, Ill. 179,128.00
3 Jones & Krueger, Springfield 245,701.20

Items	Quantity	Unit prices 1	C	2
Water mains, inst				
4" diam	lf	20	$1 50	$3 60
6"	lf	260	1 50	4 20
10"	lf	140	2 00	4 90
24"	lf	426	4 20	6 50
30"	lf	632	4 20	7 20
36"	lf	16,635	4 20	7 00
36" in tunnel	lf	104	25 00	40 00
36" RR cross (open cut)	lf	85	15 00	32 00
CI fits, inst	T	40	200 00	200 00
Gate valves, inst				
& vlv box 6"	ea	6	50 00	15 00
& vlv box 10"	ea	7	75 00	25 00
24"	ea	1	100 00	35 00
30"	ea	2	125 00	42 00
36"	ea	6	125 00	50 00
36" check vlv, ins	ea	1	125 00	60 00
Fire hydrants, ins	ea	2	100 00	40 00
Remov & repl exist fire hydrants	ea	1	200 00	60 00
Air release vlv, furn & inst	ea	9	50 00	45.00
Const vlv pits:				
24" gate vlv	ea	1	1,000	600.00
30" gate vlv	ea	2	1,100	720 00
36" gate vlv	ea	5	1,200	900 00
36" gate vlv, 36" check vlv	ea	1	2,200	1,200
Air release vlv	ea	7	550 00	500 00
Addl excav, bkfill	cy	1,500	2 00	1 00
Rock excav	cy	200	12 50	12 00
Remov & repl surf:				
Br pav, conc base	sy	200	7 50	12 00
Conc street pav	sy	200	5 00	10 00
Bit pav	sy	65	3 50	6 00
Conc drway pav	sy	30	4 50	8 00
Oil treat surf	sy	1,200	1 50	3 00
Conc curb, gutr	lf	450	2 00	3 30
Conc sidewalk	sf	1,600	3 00	.40
Sand, grav bkfill	cy	3,000	3.00	2 50
Sheet & brac, left in place	Mbm	10	200.00	200.00
Maint surf, compld wk mo		12	500.00	166.67

Concrete and steel bridge over Cimarron River, Kan.

Close bidding on the $96,428 Cimarron River bridge in Grant County, Kansas, brought in a low unit price of $43.00 per cubic yard for Class A concrete. The low bid of three is only 0.3% below the second low and 1.7% below the high. Bids were opened Nov. 6, 1950, at Ulysses, Kan. R. S. Delamater of Wichita is consulting engineer. County engineer is John E. C. Elliott, Ulysses.

The bridge will be 497 feet long with a 24-foot roadway. It will have five 75-foot continuous steel beam spans between 60-foot spans and a concrete deck on concrete pedestal type piers and abutments. The piers will set on 14" steel H piles driven through fifty feet of sand and gravel to bearing in hard clay. The beams will be fitted with shear developers and designed as composite beams.

The job must be completed in 200 working days. The contract is for bridge construction only; approach fills will be constructed by Grant County.

This bridge will replace a former county bridge washed out by high water in 1941. It will be located six miles north of Moscow where no unusual difficulties are expected. The Cimarron River through Kansas is hard to bridge and good sites are few.

The minimum wage rates of the Highway Commission are for skilled labor, $1.00; semi-skilled, $0.85; common, $0.70. The rates prevailing in the area are for skilled labor, $1.75-2.10; semi-skilled, $1.50; common, $1.00. Steel piles will be furnished by the owner in 30- and 40-foot lengths with delivery expected in March.

Class I and Class II excavation are respectively above and below the "excavation boundary plane" which is set at about one foot above normal water level.

Bidders on the job were:

1 List & Weatherly Constr. Co., Kansas City, Mo. (contract) $96,427.50
2 E. W. Geiger, Inc., Topeka, Kan. 96,678.17
3 Inland Constr. Co., Omaha, Nebr., and Wichita, Kan. 98,039.15

Items	Quantity	Unit prices 1	C	9
Excavation				
Class 1 (dry)	cy	218	$6.00	$7.00
Class 2 (wet)	cy	352	20.00	16.00
Class A concrete	cy	618.1	43.00	49.70
Reinf steel	lb	98,100	.110	.115
Struct steel	lb	275,930	.140	.130
Driv steel piles	lf	5,240	2.00	2.03
Pile splices	ea	80	20.00	10.00

WITH EACH SEASON'S PASSING

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Blending with every landscape and free from glare, roads built with Tarvia* road tar take the strain out of driving. They are self-healing under impacting traffic.

The heat-absorbing qualities of black roads built with Tarvia* road tar make them easier to keep open in winter as snow and ice melt more quickly. And they are not affected by chemicals used to remove snow and ice.

because

1. Roads built with Tarvia* road tar improve with age. Occasional applications will renew the life of the surface, and replace worn-away material.

2. TARVIA road tar penetrates surfaces and binds together the underlying material. It thus makes possible the inexpensive use of local aggregates.

3. Less TARVIA road tar is required because there are less solvents to be evaporated before the binder becomes effective.

4. TARVIA road tar is unaffected by gasoline, kerosene, or moisture. It retains its original properties.

5. TARVIA road tar holds the aggregate tightly in the surface, and produces a gritty surface which is lastingly skid-resistant.

6. TARVIA road tar may be applied at moderate temperatures, and with ordinary equipment.

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"Simplest Solutions to Special Problems..."

again offered by plywood concrete form panels

THE huge spiral ramps and reinforced concrete supports of the new University of Washington stadium grandstand presented several special form problems: all concrete surfaces were curved; ramp floor-slab thicknesses varied to provide drainage; minimum form costs were required; exposed surfaces had to be smooth, uniform, fin-free.

Douglas fir plywood forms, according to Elmer Strand, partner of Strand & Son, "offered the simplest and least expensive solution. Panels can be reused many times. They're easy to fabricate into cost-cutting built-up sections and easily bent to form curved surfaces."

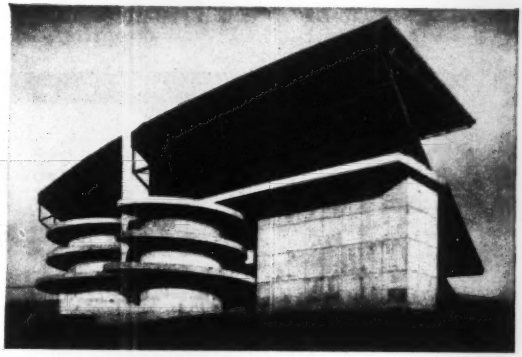
Another example of this fact: large job or small . . . versatile plywood solves more form problems, more satisfactorily, more often.

Spectacular is the word for this $1,500,000 addition to the University of Washington football stadium, Seattle. The design was prepared by George W. Stoddard and Associates, Seattle, represented by Francis E. Huggard and architect N. Torbitt. Structural engineer: Sigmund Ivarson. General Contractors: Strang & Son, Seattle; J. H. Wallstrom, superintendent. John Paul Jones was supervising architect for the University, represented by A. O. Whipple. Also representing the university was Charles C. May, superintendent of buildings and grounds.

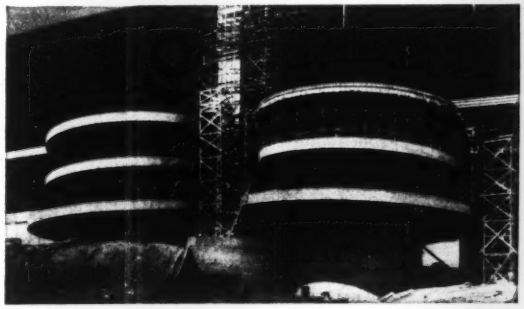
Douglas Fir Plywood

AMERICA'S

Plywood Gives Multiple Re-Use, Reduces Labor and Finishing



Twin spiral ramps—shaped like huge gears on 56′ hollow concrete shafts—keep traffic flowing smoothly. On central shafts and the 4′ guard rails, ¼″ plywood served as form liner, with lumber sheathing backed by 2x4 studs, 16″ o.c. and double 2x4 wales, spaced at about two feet. The 4′ wide form sections were bent to required curvature by inserting wooden shims between studs and walers. Sections were stripped, re-erected and bent to next required radius without reconstructing the basic form framework. On the 9″-thick walls of the main support, ¾″ plywood served as combined lining-sheathing. In addition to workability and re-use factors, finishing time and costs were reduced because of the smooth, fin-free surfaces so characteristic of plywood form work.



Large, Light, Strong Real Wood Panels

For additional data on Douglas fir plywood for concrete form work, write: Douglas Fir Plywood Association, Tacoma 2, Washington. Of particular interest are two booklets: "Concrete Forms of Douglas Fir Plywood" and "Handling PlyForm".

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CONCRETE FORM PANEL
EXTERIOR TYPE GRADE B-B
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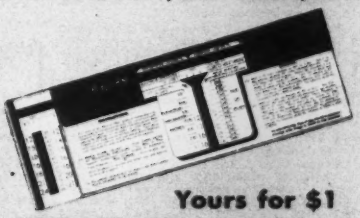
Smooth, fin-free surfaces . . . ease of handling . . . strength, rigidity, tightness . . . superior nail holding qualities . . . cost-cutting re-use factors —these are primary advantages of Plyform®. Highly moisture-resistant glues used in Ply-Form panels permit multiple re-use (as many as 10 to 15 are not unusual). For the greatest possible panel re-use, however, specify Exterior-type EXT-DFPA® Concrete Form grade of Douglas fir plywood—bonded with completely waterproof phenolic resin adhesive. For special architectural concrete, requiring the finest possible finish, the architect or contractor may specify Exterior-type or Interior-type Douglas fir plywood in grades having "A" face veneer—or one of the new plastic-surfaced panels.



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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — *J. A. MAHONEY, Reports* — *M. R. ROESSLER, Statistics*

WATER SUPPLY

BIDS ASKED

Mo., Sikeston—B.A. 1/23—City, Joe Cravens, mayor, deep well, well pump, pump house, 3 MGD water treatment, filter plant and two 1,050 GPM aerators. Plans deposit $20; Russell & Axon, 408 Olive St., St. Louis, Zone 2, engrs. CD 7/5.

O., Woodville—B.A. 1/24—City, water treatment plant imprvs., principally 2 concrete reservoirs, Sect. D, $50,000. Plans deposit $10. Finkbeiner, Pettis & Strout, 518 Jefferson St., Toledo, engrs.

Mich., Detroit—B.A. 1/25—Bd. Water Comrs., 735 Randolph St., Zone 26, Northeast Station low lift plant substructure. Plans deposit $25. L. G. Lenhardt, 735 Randolph St., ch. engr. CD 8/30/44.

Tex., Terrell—B.A. 1/30—City, E. E. Boyd, city mgr., Terrell filter plant imprvs., incl. chemical storage bldg., flocculators, sedimentation basin and 1 m.g.d. filter. $126,000. Plans deposit $25. Freese & Nichols, 407 Danciger Bldg., Fort Worth, engrs.

▲ Tex., Big Spring and Odessa—B.A. 2/7—Colorado River Municipal Water Dist., c/o R. T. Piner, pres., Big Spring, water supply lines, incl. Sec. 1, 25.9 mi. 30 in. line, Sec. 2, 31.7 mi. 24 in. line, Sec. 3, 31.4 mi. 24 in. line, $4,500,000; earthen dam on Colorado River, $1,900,000, both between Big Spring and Odessa. Plans deposit $50 each. Freese & Nichols, 407 Danciger Bldg., Fort Worth, engrs. CD 11/27.

CONTRACTS AWARDED

▲ Ley Constr. Co., 124 State St., Springfield, Mass. Contract Awarded, $1,087,800. Water supply filter, sys., addn. West Parish filters, SPRINGFIELD, MASS., City, Water Dpt., City Hall. Awarded Dec. 28. CD 12/20 under L. B.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Va., Manassas—B.A. 1/25—Bd. Supervs. Prince William Co., Court House, Contr. I sewage collecting sys., approx. 3.92 mi. 8 and 10 in. sewer laterals and outfall; Contr. 2, sewage treatment plant; Contr. 3, well pump, pump controls etc. Plans deposit $40. John R. Williams, 1225 19 St. N.W., Wash. 6, D. C., engr.

Calif., Elsinore—B.A. 1/29—City Council, City Hall, sewage treatment plant, $122,000. F. H. Bulot, 491 W. 5 St., Los Angeles, engr. CD 5/24.

Calif., Ford City—B.A. 1/29—Ford City Sanitation Dist. 2, Court House, Bakersfield, sewer collection lines and house connections, $149,651; trunk line sewers, $33,389. R. F. White, 1716 Oak St., Bakersfield, engr. CD 6/22.

Calif., Taft—B.A. 1/29—Taft Heights Sanitation Dist. No. 1, Court House, Bakersfield, sewer collection line and house connections, $137,448. Plans deposit $10. sanitary sewer trunk line, $33,815. Plans deposit $10. R. F. White, 1716 Oak St., Bakersfield, engr. CD 8/25.

Conn., Norwalk—B.A. 1/30—City P. Wks. Dpt., City Hall, Contr. 1, rehabilitation sedimentation tanks, rebuild sludge collection mechanism steel, inlet walls, influent pipe supports, resurf. tank floors and concrete surfaces. Plans deposit $10; Contr. 2, sewage treatment plant, addn., alterations, constr. equip., altering existing bldgs., etc. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., engrs. CD 3/29/49.

Ga., La Grange—B.A. 1/30—City, sanitary sewer imprvs. Wiedeman & Singleton, P. O. Box 1878, Atlanta, engrs. CD 11/20, under LB.

Ga., Commerce—B.A. 1/31—City, 20 mi. 8- to 15-in. sewer lines and 500,000 gal. disposal plant. Plans deposit $15. The Harwood Beebe Co., Montgomery Bldg., Spartanburg, S. C., engr.

Pa., Mayview—B.A. 1/31—General State Auth., 18 and Herr Sts., Harrisburg, sewage treatment plant and pumping station, $220,000. Plans deposit $10 each. Morris Knowles, 1312 Park Bldg., Pittsburgh, Zone 22, engr. CD 12/14, under LB.

STREETS AND ROADS

LOW BIDDERS

Jessee Smith, 444 E. Ross St., Glendale, Calif., Low Bidder, $66,028. 7 mi. widn., plants mix surf. on untreated rock base, widn., reinf. con. bridge Pacific Coast Hy. at Sunset and Chautauqua Blvds. Los Angeles Co. CALIFORNIA, State Div. Hys., 120 S. Spring St., Los Angeles. Bids Jan. 4. CD 12/11.

▲ State Hy. Dpt., Columbus 15, O., rejected bids Dec. 12, to conc. U. S. R. 22 DA in Wilmington, Clinton Co., est. $218,600; paving U. S. R. 33, Russell Pt. and Lakeview, Logan Co., est. $147,400; Akron Expressway Sys. Part No. 4 S. R. 5, Summit Co., est. $1,216,000, OHIO. CD 12/8.

CONTRACTS AWARDED

Griffith Co., 1060 S. Broadway, Los Angeles, Calif., Contract Awarded, $660,552, grading, paving 6.3 mi. constr. 5 reinf.-con. bridges between 1 mile north of Goshen and Traver, Tulare Co. CALIFORNIA, State Div. Hys., P. Wks. Bldg., Sacramento, Bids Dec. 28, awarded 1/4. CD 1/3, under LB.

E. H. Hines Constr. Co., Box 924, Greenwood, S. C., Contract Awarded, $505,404. est. $400,000-$500,000. traffic bound macad., b. conc. binder and surf. course 12.75 mi., from point U. S. 117, 1 mi. south of Burgaw, south crossing Cape Fear River to a point approx. 0.3 mi. south of Cape Fear River, Proj. 3781, Pender and New Hanover Counties, NORTH CAROLINA, State Hy. and Pub. Wks. Comm., Raleigh. Bids Dec. 19. CD 12/26. under LB.

▲ Cuyahoga Asphalt & Paving Co., 13125 Shaker Square, Cleveland, O. Contract Awarded. $86,610, est. $83,440. b. conc. widn. type T 35, S. R. 87, Geauga Co.*** Fenton Constr. Co., P.O. Box 310, Ashland, O. $401,945, est. $419,100, b. conc. resurf. concrete structure, type T 35, U. S. R. 127, Darke Co.***

V. N. Holderman & Sons, Inc., 890 Oakland Park Ave., Columbus, O. $1,750,891, est. $2,078,500, paving Type T 71 and structures S. R. 7, Athens and Meigs Counties ***Lander E. Son, Inc., Station E, Box 6, Toledo, O., $606,187, est. $600,300 paving, and structure steel, cement, Type T 71 and U. S. R. 25, Lucas Co.*** Arthur S. Langenderfer, Inc., 4690 W. Bancroft St., Toledo, O. $126,995, est. $166,550 b. conc. type T 35, S. R. 2, Fulton Co.***Lewis & Frisinger Co., 2143 Madison St., Ann Arbor, Mich., $1,758,932 est. $2,077,300 paving, steel structure Type T 71, U. S. R. 30, Wayne Co.***Manix Brothers, R. R. No. 1, Greenville, O. $75,721, est. $87,950 structure Type T 32, S. R. 49 on R-11, Darke Co.***Shullo Constr. Co., 1200 Home Ave., Akron, O. $342,215, est. $246,215, conc. widn. S. R. 8, Summit Co.*** U. S. Constr. Co., 115 E. Johnson St., Upper Sandusky, O. $64,543, est., $71,250 paving C. R. Nos. 197 and 209, Type T 32, on B 20, Union Co.***Visintine & Co., 1315 Edgehill Rd., Columbus, O., $2,575,000, est. $2,077,300 paving, steel structure Type T 71, crossing elimination U. S. R. 23, S. R. 18 and 12, Seneca, Hancock and Wood Counties, OHIO, State Hy. Dpt., Columbus. Grand total $7,793,042. CD 12/8.

Wesco Paving Co., Volunteer Bldg., Chattanooga, Tenn. Contract Awarded $589,285. bit. materials widn., resurf. 26.971 mi. sect. State Hy. 34 from Hawkins Co. line to Washington Co. line, Proj. SAP 344-B, Green Co., TENNESSEE, State Hy. Dpt., Nashville, Tenn. CD 1/3 under LB.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
B.A. Bids Asked
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

EARTHWORK, WATERWAYS

BIDS ASKED

† Maryland—B.A. 1/24—U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore, Zone 3, maintenance and imprv. dredging Brewerton Sect. and Brewerton-Fort McHenry Angle, Baltimore Harbor and Channels, CIVENG 18-020-51-5. Extended date. CD 12/11.

† Tex., Killeen—B.A. 1/25—U. S. Eng., 606 Santa Fe Bldg., Galveston, augmentation of site facilities, National Guard, North Fort Hood, Inv. No. ENG 41-243-51-20. Plans deposit $10.

† Alabama—B.A. 1/30—U. S. Eng., P. O. Box 1169, Mobile, lock and dam on Warrior, Black, Warrior and Tombigbee Rivers near Demopolis, Marengo Co., CIVENG-01-076-51-7. Extended date. CD 11/15.

† Kansas and Missouri—B.A. About 1/30—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., seeding 200 acres Levee Unit 440-R, along right bank of Missouri River in Atchison and Doniphan Counties, Kan. and Buchanan Co., Mo., CIVENG 23-028-51-60.

† Ohio—B.A. 1/30—U. S. Eng., Madison Ave. and 8 St. West, Huntington, 18, W. Va., pressure relief wells for Local Protection Project, Portsmouth-New Boston, Serial No. CIVENG 46-022-51-63.

† Calif., Los Angeles—B.A. 1/30—Bd. Supervs., Los Angeles Co., 501 Hall of Records, site clearance, removal of earth, concrete, etc. for Municipal Superior Courts Bldg., Spec. 1281, $154,000. R. E. Shonerd, co. mech. engr. CD 8/17/45, under Public Buildings.

CONTRACTS AWARDED

R. V. Lloyd & Co., Box 391, Coachella, Calif. Contracts Awarded, $520,734, earthwork, pipelines, and structures laterals 88.6, 914 and 93.0 and Part 1 of Unit 9, Coachella Valley Distribution System, All-American Canal System, Boulder Canyon Proj. in vicinity of Mecca, Spec. DS-3219, ARIZONA-CALIFORNIA and NEVADA. Bureau Reclamation, Dept. Interior, Coachella, Calif. Bids Nov. 21, awarded Jan. 2. CD 12/11, under LB.

AIRPORTS

BIDS ASKED

Ala., Huntsville—ADMINISTRATION—B.A. 1/25—City, administration bldg. at Huntsville Airport. Plans deposit $25. G. W. Jones & Sons, Huntsville, engrs.

N. Y., Idlewild—TERMINAL BLDG.—B.A. 1/25—At Office Chief Engineer of The Port of New York Auth., 111 8th Ave., New York, Zone 11, Phase 2, expansion of temporary terminal bldg., Contr. NYA-145. Plans deposit $25. CD 4/27/44.

CONTRACTS AWARDED

† Starr Constr. Co., P.O. Box 341, Greenville, Miss. Contract Awarded, $818,000, rehabilitation Greenville Air Force Base, GREENVILLE, MISS. Purchasing & Contracting Office, Scott Air Force Base, Ill. CD 1/3, under LB.

▲† General Electric Co., River Rd., Schenectady, N. Y. Contract Awarded, $5,040,402, elec-drive system for 8 ft. supersonic wind tunnel, Spec. A-4602, Req. A-4602, MOFFETT FIELD, CALIF. National Advisory Committee for Aeronautics, Ames Aeronautical Laboratory, Moffett Field. Bids Dec. 6, awarded Jan. 2. CD 12/12, under LB.

PUBLIC BUILDINGS

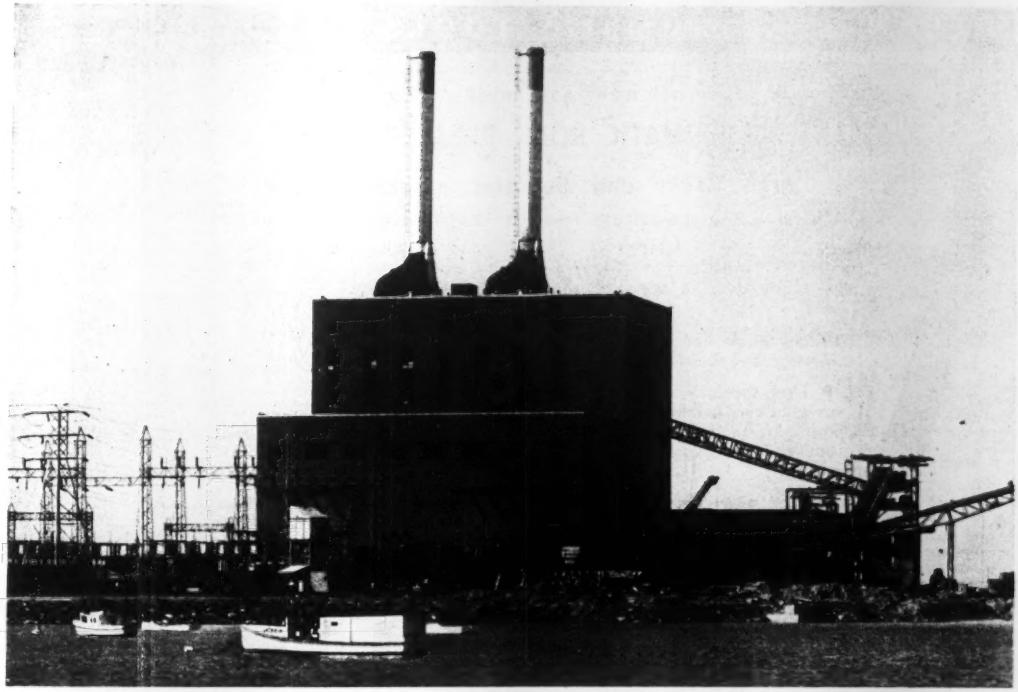
BIDS ASKED

Ind., Noblesville—SCHOOL—B.A. 1/23—Bd. Educ., Noblesville, school, $440,000. McGuire & Shook, Fletcher Trust Bldg., Indianapolis, archts. CD 2/4/49.

Ont., Hanover—SCHOOL—B.A. 1/23—Hanover Public School Bd., H. J. Mann, secy-treas. Hanover, 1 story T-shaped 156x287½ ft., Jantzes A. Magee School on Moore St. on 10½ acre site. Plans deposit $25. S. B. Coon & Sons, 4 St. Thomas St., Toronto, archts.

† Arizona—B.A. 1/24—SHOPS—Bureau Reclamation, Dpt. Interior, Phoenix, machine, apparatus repair shops at system operation and maintenance area near Phoenix, Davis Dam Proj., Spec. 3000-B. L. N. McClellan, Bldg. 1-A, Denver Federal Center, Denver, Colo., ch. engr.

† Md., White Oak—B.A. 1/24—Public Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., installation of piping and electrical equip. for continuous wind tunnel in Bldg. 403, and concrete pipe tunnel between Bldg. 402 and 403 at Naval Ordnance Laboratory, NOY 16863, Spec. 20757. Plans deposit $40, CD 7/26/48.



New Steam Generating Plant
in WESTERN NEW YORK

The plant shown above is a new steam-electric generating station at Dunkirk, N. Y., built by the Niagara Mohawk Power Corporation to supplement its other facilities for furnishing electric power to the Western New York area.

The Dunkirk Steam-Electric Station is one of 81 hydro- and 6 steam-electric stations comprising the Niagara Mohawk System, and is the most modern generating station ever constructed. The installed capacity of the station is 160,000 kw, and this can be increased to 320,000 kw should the need arise. The station's turbine generator is new in design, and is the first of its type to be manufactured.

The Dunkirk Station has two 60-cycle, steam-electric generating units, each with a rated capacity of 80,000 kw. Its coal-fired steam generators supply steam at 1450 lb and 1000 F to the turbines, each of which is connected to a 60-cycle, 13,800-volt generator with transformers, to deliver power to the 115,000-volt transmission system.

The 5147 tons of steel in the framework and boiler supports of the Dunkirk Steam-Electric Station was fabricated and erected by Bethlehem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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FABRICATED STEEL CONSTRUCTION

BETHLEHEM STEEL

ATLANTIC Pneumatic TOOLS

Use with your standard power pavement equipment . . . .

THE ATLANTIC PNEUMATIC ROCK BREAKER

Splits Large Rocks and Boulders quickly
No Plugs and Feathers — No Explosives
Nearly 4½ times faster

- Effective quick action in removing stones, boulders and rocks from excavations and ditches.
- Eliminates the slow and costly plug and feather method, and the risky and troublesome use of explosives.
- The specially heat-treated Atlantic Tool Steel used in the Atlantic Pneumatic Rock Breaker gives it the extreme toughness to withstand the severest usage and resist breakage regardless of the hardness of the stone.
- Used with standard power pavement breakers. No tool upkeep. Tougher than any stone. A size for every service.

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Specialists in Tool Steels for chisels, drills, blacksmith tools and Alloy Steels for axles, bolts, pins, pistons and shafts.

Non-tempering tool steels for greater safety and speed.

ATLANTIC STEEL CORP. 1775 BROADWAY, N. Y. 19

▲ **N. Y., North Hempstead**—SCHOOL—B.A. 1/24—Bd. Educ., U.F.S.D. 7, Great Neck, school, $1,00,000. Moore & Hutchins, 215 E. 37 St., New York 16, N. Y., archts.

O. **Akron**—HIGH SCHOOL—B.A. 1/24—Bd. Educ., Hazel Fleek, clk., 70 N. Broadway, Kenmore High School alterations, improvs., 2135-15 St. Plans deposit $15. Erwin F. Bliss, c/o owner, archt. CD 3/23.

Pa., **State College**—LABORATORY—B.A. 1/24—General State Auth., 18 and Herr Sts., Harrisburg, laboratory work room and greenhouse. $180,000. Plans deposit $10. Milton S. Osborne, 506 Sunset Rd., State College, archt. A. F. Jones, c/o owner, ch. engr. CD 12/20/49.

† S. C., **Charleston**—SHOP—B.A. 1/24—Yards & Docks Annex, Dpt. Navy, Arlington, Va., conversion Bldg. 21 into work shop, NOY 22625, Spec. 25340. Plans deposit $10. Extended date. CD 12/14.

▲ **Ont., St. Thomas**—HOSPITAL—B.A. 1/24—St. Thomas Elgin General Hospital Bd., Pearl St., 5 story (ultimately 6 story) rein.-con. T-shaped hospital, $2,500,000. Gowan, Ferguson, Lindsay, Kaminker, Maw, Langley & Keenleyside, 515 Jarvis St. Toronto archts. CD 8/15.

Ky., **Madisonville**—SCHOOL—B.A. 1/25—City and Hopkins Co. Bd. Educ., 60,000 cu. ft. school addn., $500,000. H. Lawrence Casner, 53 N. Main St., archt. CD 9/6.

Md., **Catonsville**—BOILER HOUSE—B.A. 1/25—State, Dpt. P. Imprvts., 506 Park Ave., Baltimore, Zone 1, boiler house addn., alterations, Spring Grove State Hospital $310,000. Plans deposit $15, H. Walton Redmile, 2017 Maryland Ave., Baltimore, Zone 12, engr. CD 12/11.

Miss., **Brookhaven**—HOUSING—B.A. 1/25—Brookhaven Housing Auth., 100 housing units, Proj. Miss. 60-1. Plans deposit $50, Landry & Matthes, 214 W. Pine St., Hattiesburg, archt. CD 1/19/50.

Miss., **Greenwood**—SCHOOLS—B.A. 1/25—Greenwood Separate School Dist., 42,000 sq. ft. North Greenwood School; 52,700 sq. ft. Broad St. School. Plans deposit $35 each, Robert J. Moor, Kantor Bldg., archt. CD 3/17/49.

▲† **N. J., Trenton**—LABORATORY—B.A. 1/25—Dpt. Navy, Yards & Docks Annex, Arlington, Va., laboratory (high pressure blower and test wing) NOY 22367, $4,600,000. Extended date. Frank Grad & Sons, 187 Market St., Newark, archts.

N. Y., Middletown—SCHOOL—B.A. 1/25—Bd. Educ., 159 Prospect St., school, De Witt St. and Irwin Ave.

▲ **O., Columbus**—COURT HOUSE—B.A. 1/25—Franklin Co. Building Comn., Court House, Columbus, Court House annex. $1,500,000. CD 2/21/49.

Tenn., Clarksville—HOUSING—B.A. 1/25—Clarksville Housing Auth., c/o Speight & Hibbs, archts., Clarksville, 200 unit housing, Tenn 10-1 and Tenn 10-2. (Correction status). CD 12/14, under CA.

Tenn., Knoxville—HIGH SCHOOL—B.A. 1/25—City Bd. Educ., c/o Bealer & Wilhoit, archts., Jounral Arcade, 3 story, 70,000 sq. ft. Negro High School. CD 10/13.

† **N. M., Los Alamos**—BUILDINGS, etc.—B.A. 1/27—U. S. Atomic Energy Comn., Los Alamos, rein.-con. buildings and related services. $300,000-$400,000. Plans deposit $50. Black & Veatch, c/o C. A. Slocumb, Los Alamos, engrs.

Tenn., Bristol—HIGH SCHOOL—B.A. About 1/29—City, Bristol High School, $600,000. A. L. Aydelott & Assoc., 2080 Peabody St., Memphis, archts.

† **Calif., San Diego**—LABORATORY—B.A. 1/29—Dpt. Navy, 1220 Pacific Hy., San Diego, 3 story, rein.-con. electronics laboratory and 2 story addn. $300,000. Plans deposit $150.

▲ **Ala., Auburn**—DORMITORY—B.A. 1/30—Alabama Polytechnic Institute, Auburn, 600 girls dormitory. $1,500,000. Plans deposit $50. Warren, Knight & Davis, Protective Life Bldg., Birmingham, archts. CD 2/27/45.

Calif., Folsom—SEGRAGATION UNIT—B.A. 1/30—State Div. Architecture, P. Wks. Bldg., Sacramento, constr. segragation unit, Folsom State Prison. Plans deposit $25. CD 2/8/45.

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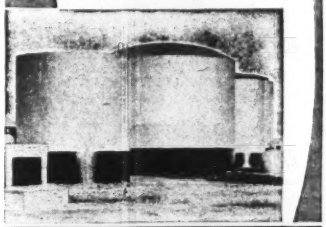

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Ill., Carbondale—WOMEN'S DORMITORY GROUP—B.A. 1/30—State, State Capitol, Springfield, general work, plumbing, ventilating, electrical and kitchen equipment for women's dormitory group, Southern Illinois University, $750,000.

Ind., Frankfort—POWER PLANT WIRING—B.A. 1/30—Bd. P. Wks., City Hall, complete system power plant wiring for municipal plant. Approx. $60,000. Plans deposit $10. Emery, Marker & Emery, 510 Toledo Trust Bldg., Toledo, O., engrs. CD 2/20/48.

† N. Y., New York—HOSPITAL—B.A. 1/30—U. S. Eng., 80 Lafayette St., New York, Zone 13, building and utilities for Veterans Admin. General-Medical Hospital in area bounded by 1st Ave., E. 23 and E. 25 St., Serial No. CIVENG 30-075-51-43. Plans deposit $50. CD 1/20.

O., Centerville—SCHOOL—B.A. 1/30—Bd. Educ., Washington Twp., Gilbert B. Burriff, clk., Local School Dist., 2 story school addn. Plans deposit $10. Walker, Norwich & Templin, American Bldg., Dayton, archts. CD 11/28.

▲ Tex., Corsicana—HOUSING—B.A. 1/30—Corsicana Housing Auth., W. H. Faughn, Dir., Corsicana, 114 dwelling units in 45 bldgs. and admin. bldg., brick veneer concrete fdn. and roof const. $1,250,000. Plans deposit $50. Boese & Harkrider, 308 T & P Bldg., Fort Worth, archts. CD 10/5/49.

Tex., Fort Worth—HIGH SCHOOL—B.A. 1/30—Castleberry School Dist., Castleberry, via Fort Worth, high school. $300,000. A. B. Withers, Insurance Bldg., archt. CD 5/19.

† Utah, Salt Lake City—GARAGE—B.A. 1/30—Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C., 5-car garage, for Veterans Admin. Regional Office, 1710 Redwood Rd. CD 6/23, under LB.

N. Y., Jamaica—HOSPITAL—B.A. 1/31—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Contr. 1, general contract; Contr. 2, plumbing; Contr. 3, heating and ventilating; Contr. 4, electrical work for alterations, addns. to out-patient and admitting division, addnl. wing for specialty wards, service lines, plant addns. and tunnels, garage addn. at Queens General Hospital, Queens Boro. Plans deposit $50 Contr. 1, $30 each, Contrs. 2, 3, and 4. CD 3/13/47.

▲ N. Y., Rochester—HOUSING—B.A. 1/31—At office Fred W. Ereth, purch. Agent, City Hall, fdns. and general constr.; heating and ventilating; electrical; plumbing; elevators for Rochester Housing Proj. NYS-53, incl. bldgs. numbered 1 through 7, in area bounded by Hanover, Herman and Vienna Sts. and east line of Joseph Ave. Est. $4,000,000. Plans deposit $75. Donald Q. Faragher, 900 Powers Bldg., Zone 14, archt.

Pa., State College—LIBRARY—B.A. 1/31—General State Auth., 18 and Herr Sts., Harrisburg, general const.; main library. $940,000. Plans deposit $15 eacn. Kuhn & Newcomer, 470 Washington Rd., Pittsburgh, Zone 28, archts. A. F. Jones, c/o owner, ch. engr. CD 5/26.

▲ N. Y., Peekskill—HOUSING—B.A. 2/1—Peekskill Housing Auth., Municipal Bldg., Dunbar Heights Housing. $1,119,000. Plans deposit $50. Bids 10/24 rejected. CD 11/3, under LB.

▲ Minn., Minneapolis—HOSPITAL—B.A. 2/21—University of Minnesota, at office R. S. Callaway, purch. agt., 323 Admin. Bldg., Main Campus, constr. Mayo Memorial Medical Center at University of Minnesota, $9,500,000. Plans deposit $200 refunded. C. H. Johnston, 715 Empiere Bank Bldg., St. Paul, archts. CD 1/31/45.

LOW BIDDERS

Nomellini Constr. Co., P.O. Box 542, Stockton, Calif., Low Bidder, $642,500, general work, 2 bldgs. elevator kitchen, diner commissary bldg., boiler house for Institution for Epileptics, Dpt. Finance, SACRAMENTO, CALIF. State Div. Architecture, P. W. Bldg., Sacramento. Awarded 1/5. CD 1/5, under LB.

CONTRACTS AWARDED

▲ Parker, Steffens & Pearce, 135 S. Park St., San Francisco, Calif. Contract Awarded, $1,515,600, general work, education bldg. Dpt. Finance, SACRAMENTO, CALIF. State Div. Architecture, P. W. Bldg., Sacramento. Awarded 1/5. CD 1/5, under LB.

A. F. Peaslee, 15 Lewis St., Hartford, Conn., Contract Awarded, $945,000. Kingswood Elementary School. DANIELSON, CONN. Town, Town Hall. Bids Nov. 28, awarded Dec. 29. CD 12/15, under LB.

▲ Leslie C. Elson, 111 W. Washington St., Chicago, 2, Ill., Contract Awarded, $1,200,000. 1 and 2 story, 125 unit frame, brick homes, ROCK FALLS, ILL. Whiteside County Housing Auth., Central Trust Bldg., Sterling, Ill. Awarded Dec. 26. CD 12/22.

† Jensen & Ridge, 622 E. 3 St., Wichita, Kan. Contract Awarded. $598,299. rehabilitation Kansas Ordnance Works, PARSONS, KAN. U. S. Eng., Davidson Bldg., Kansas City 8, Mo. Awarded Dec. 29. CD 1/3, under LB.

▲† Tennessee Valley Auth., New Sprankle Bldg., Knoxville, Tenn. Own Forces. $120,000,000. steam electric power plant on Ohio River, 15 mi. northwest of Paducah, KENTUCKY.

Pearson Constr. Co., Benton Harbor, Mich. Contract Awarded. $805,800. 94 brick housing units, USPHA Proj. Mich. 10-1, Conkey Field, BENTON HARBOR, MICH. City, Elden Butzbaugh, chn., Benton Harbor. Bids Dec. 21. CD 12/1.

C. A. Austin Co., Gaylord, Mich., Contract Awarded. $527,400. 2 story, bsmnt., brick, steel high-grade school. GAYLORD, MICH. City, Melvin Freel, secy., Bd. Educ., Gaylord, Mich. Bids Dec. 14. CD 11/24.

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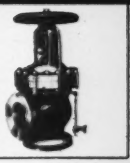
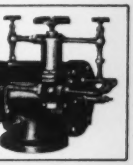
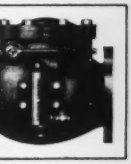


G-A Triple-Acting Non-Return Valve for safety needed on high pressure boilers. Bulletin S-1A sent on request.



G-A Surge Relief Valve protects water lines against excessive pressures caused by surges in the system. Bulletin W-2 describes this valve in detail.



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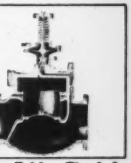

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▲ **Spence Brothers**, 417 McCoskry St., Saginaw, Mich. Contract Awarded. $1,280,945. 2 story, bsmnt., brick, steel South Central Elementary School, PORT HURON, MICH., City, Bd. Educ., Port Huron. Bids Dec. 14. CD 12/8.

▲ **C. H. Reisdorf, Inc.**, 831 Fox Bldg., Detroit, Mich. Contract Awarded. $1,210,000. 48 brick housing unit Proj. Mich. 8-1, Beechwood and Polk Sts., 52 housing unit Proj. Mich. 8-2, Coolidge Hy. and Goodell Ave., RIVER ROUGE, MICH., City River Rouge Housing Comn., 1381 Coolidge Hy., River Rouge, Mich. Bids Dec. 18. CD 11/24.

▲ **Combustion Engineering Co., Inc.** and **Super Heater Inc.**, 200 Madison Ave., New York, 16, N. Y. Contract Awarded. $3,303,016. two 450,000 lb. per hr. steam boilers for 74 Street Power Plant (Contr. P-71 revised), NEW YORK, N. Y. Bd. Transportation, 250 Hudson St., New York, 13, N. Y. Bids Dec. 4, awarded Dec. 6. CD 12/8, under LB.

▲ **Rizzi Constr. Co., Inc.**, 101 Park Ave., New York 7, N. Y., Contract Awarded, $2,323,800. foundations and appurtenances for Edenwald Houses (Proj. No. NY 5-19) in area bounded by Laconia Ave., Grenada Pl., E. 233 St., Baychester and Schieffelin Aves. and 225 St., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., 63 Park Row, Zone 7. Bids Dec. 5. CD 12/7, under LB.

▲ **Colmar Constr. Co.**, 364 Gold St., Brooklyn, 1, N. Y. Contract Awarded. $1,254,364. P. S. 11, Skillman Ave. from 56 to 54 Sts., WOODSIDE, N. Y. Supt. School Buildings, Design & Constr. 49 Flatbush Ave. exten. Brooklyn, 1, N. Y. Bids Dec. 5. CD 12/8, under LB.

▲ **Harmon Constr. Co.**, 100 S. Indiana St., Oklahoma City, Okla. Contract Awarded. $1,810,484. 210 housing units, JACKSON, TENN. Jackson Housing Auth. Jackson, Tenn. CD 12/22, under LB.

† **Wise Contg. Co.**, 8 and Grace Sts., Richmond, Va. Contract Awarded. $581,400. 3 story, 50x265 ft. concrete, brick, masonry barracks and 1 story, bsmnt., 50x170 ft. mess hall, FORT LEE, VA. U. S. Eng., 1 and Douglas Sts. N. W., Wash., 25, D. C. Bids Oct. 24, awarded Dec. 8. CD 10/31, under LB.

M. Sullivan & Son Ltd., 445 Montreal St., Hamilton, Ont. Contract Awarded. $639,000. hospital addn. 4 story bsmnt 81 bed childrens wing KINGSTON, ONT. Kingston General Hospital Bd. Governors, Kingston, Ont. Bids Dec. 28, awarded 1/3. CD 12/7.

▲ **Active Subdivisions Ltd.**, 371 Bay St., Toronto, Ont. Contract Awarded. $3,000,000. 300 to 350 housing development, installing sewers, water services on 63 acre site at Simcoe and Thomas Sts., OSHAWA, ONT City, Michael Starr, mayor, City Hall. CD 11/26-47.

▲ **Redfern Constr. Co. Ltd.**, 88 Laird Dr., Leaside, Ont., Contract Awarded Approx. $3,500,000. 5 story with central penthouse and 3 story side wings office for Workmen's Compensation Board Head Office, TORONTO, ONT. Ontario Dpt. P. Wks., G. N. Williams, deputy minister, Parliament Bldg., Toronto. Bids Nov. 20, awarded 1/4. CD 10/2/26.

COMMERCIAL BUILDINGS

BIDS ASKED

▲ **Tex., Dallas**—BANK—B.A. 1/30—First Natl. Bank, 1401 Main St., bank, $1,000,000. George L. Dahl, 2101 N. St. Paul St., engr. and archt.

LOW BIDDERS

▲ **George W. Lathrop & Sons, Inc.**, 1510 Montcalm St., Toledo 0. Low Bidder, $3,222,825, 200-bed hospital St. Charles Hospital, at Navarre Ave. and Wheeling St., TOLEDO, O. Robert Carter Co., 125 S. Erie St., $442,698, plumbing and drainage, $543,621, heating, ventilating and air-conditioning, Sisters of Mercy, Mercy Hospital, 2221 Madison St., Toledo. Bids Jan. 4. CD 1/3.

CONTRACTS AWARDED

▲ **Chicago Bank Equipment Co.**, 5412 N. Clark St., Chicago 40, Ill., Contract Awarded, $1,000,000. shops and offices, OAK PARK, ILL. Oak Park Federal Savings & Loan Assn., 105 N. Marion St., Oak Park, Ill.

▲ **Sullivan & Cozzart**, 822 W. Kentucky St., Louisville, Ky. Contract Awarded. $2,000,000. Department store, LOUISVILLE, KY. Henry A. Marks and Dolph Hartveld, Union Trust Bldg., Cincinnati, O. J. C. Penney, lessee, 330 W. 34 St., New York, N. Y. CD 12/12.

Emil Van Sile Co., 3443 E. Canfield St., Detroit, Mich. Contract Awarded. $635,000. 1 and 2 story, bsmnt., brick, stone church, social hall, West Maple and Pleasant Sts., BIRMINGHAM, MICH. First Methodist Church, Rev. Dr. Arnold F. Runkel, 552 Madison St., Birmingham, Mich. Bids Dec. 4. CD 11/27.

Sorenson-Gross Co., Flint, Mich. Contract Awarded. $645,000. 1 story, bsmnt., 130x190 ft., stone, concrete church and chapel, incl. 80 ft. tower bell carillon, FLINT, MICH. First Baptist Parish, E. Court St., Flint, Mich. CD 2/20/50.

▲ **Marbinc, Inc.**, headed by Martin Fisher, 120-44 Queens Blvd., Kew Gardens, L. I., N. Y. Owner builds $3,000,000. 295 apartment project at 352-576 Mt. Prospect Ave., NEWARK, N. J.

▲ **J. M. Marino Co.**, 2617 E. 110 St., Cleveland, O. Design and sonstruct. Contract Awarded. $1,500,000. 500x600 ft. shopping center of 20 units, GARFIELD HEIGHTS, O. Z. M. P. Realty Inc., 3791 E. 77 St., Cleveland. Damon, Worley & Assoc., Engineers Bldg., Cleveland, archts.

▲ **Robert E. McKee**, Box 2848, Dallas, Tex. Contract Awarded, $1,221,000. Est. $1,000,000. 10 story brick, concrete, steel, bank and office, TEMPLE, TEX. Temple Natl. Bank, c/o pres., Temple. Bids Dec. 19. Awarded Jan. 2. CD 12/28, under LB.

INDUSTRIAL BUILDINGS

BIDS ASKED

▲ **Tex., Mount Vernon**—FACTORY—Bids Asked—Owner c/o Sam Harvey & H. St. Clair, Mount Vernon, glove factory. $3,000,000. CD 12/29.

CONTRACTS AWARDED

▲ **Bechtel Corp., 3780 Wilshire Blvd.**, Los Angeles, Calif., Contract Awarded. Approx. $4,400,000. erecting electrical sub-station to be known as Cutler Substation, NORWALK, CALIF. Southern California Edison Co., 601 W. 5 St., Los Angeles, Calif.

▲ **F. W. Owens Co.**, 118 N. 5 St., Louisville, 1, Ky., Contract Awarded, $1,000,000. three whisky WAREHOUSES MILAN, IND. Jas. Seagram & Sons, Lawrenceburg, Inc.

Kuhne-Simmons Co., Inc., 1048 Penobscot Bldg., Detroit, Mich. Contract Awarded. $590,000. 1 story, 205x500 ft., concrete, masonry WAREHOUSE, incl. office facilities, COLDWATER, MICH., Gamble-Skogmo Co., Coldwater, Mich. CD 11/28.

Ted Farris Const. Co., 116 S. Walker St., Oklahoma City 4, Okla. Contract Awarded, $975,000. est. $1,000,000. carbon black PLANT, east of SHAMROCK, TEX. United Carbon Co., United Carbon Bldg., Charleston, W. Va. Clifford Alexander, Shamrock, engr. Awarded Dec. 12. CD 1/4. Under LB.

William J. Lundrigan Ltd., 25 Poplars Rd., Corner Brook, Newfoundland. Contract Awarded. Approx. $2,000,000 gypsum PLANT, HUMBERMOUTH, NEWFOUNDLAND, Dpt. Economic Development, St. John (Prov. Govt.) CD 12/4.

UNCLASSIFIED

BIDS ASKED

N. Y., New York—OUTDOOR SUB-STATIONS—B.A. 1/23—Bd. Water Supply, 120 Wall St., Zone 7. Contr. 428, furnishing, testing, del. 2 outdoor unit sub-stations, each having 150 kva. capacity at 60 cycles 3 phase and approx. 300 ft. of 3 kv electric cable, 3-conductor, No. 6. Bids 12/27 rejected. CD 12/11.

† **N. C., Camp Lejeune**—ELECTRICAL DISTRIBUTION SYSTEM—B.A. 1/29—P. Wks. Office, Bldg. 1005, Marine Barracks, exten. industrial area electrical dist. sys. into second division shop area at Marine Barracks, Spec. 26352. Plans deposit $10.

† **California**—PUMPING UNITS—B.A. 1/30—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing 58 motor-driven, vertical-shaft pumping units for Central Valley Proj., Spec. DS-3273. Michael W. Straus, comr.; adv. ENR 1/18.

Pa., Bethlehem—FIRE POLICE ALARM SYS.—B.A. 1/30—City, City Hall, 53 E. Broad St., fire and police alarm signalling sys., traffic control cable. Plans deposit $25. Snyder & Robinson, 1007 N. Front St., engrs.

† **D. C., Wash.**—POWER EQUIPMENT, etc.—B.A. 1/31—P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash. 25, D. C., power equipment and accessories, Spec. 23221.

Tex., Galveston—PIERS—B.A. 2/1—Galveston Wharves, Inc., 2324 Strand St., Pier 35 rehabilitation and enlargement. $500,000. CD 12/27.

Tex., Austin—MAUSOLEUM—Bids Asked—Texas Mausoleum Corp., c/o W. H. Johnson, et al, Littlefield Bldg., 488 crypts, mausoleum. $450,000. CD 10/6.

CONTRACTS AWARDED

▲ **Gentry Constr. Co.**, Jackson Mich. Contract Awarded. $1,400,000. 55 mi. natural gas main, PORT HURON, MICH. Southeastern Michigan Gas Co., Port Huron, Mich.

▲ **Utility Electric Co., Inc.**, 92 Liberty St., New York, 6, N. Y. Contract Awarded. $564,900, furnishing, installing DC connections and associated work for Culver Line, BMT Div. from W. 8 St. to Ditmas Ave., Line B IND Div., Ditmas Ave. to Seely St.***Harry Alexander, Inc., 25 W. 43 St., New York, 18, N. Y., $355,281, rerouting cables on account of demolition Lexington Ave. elevated structures, Contr. P-65***Poirier & McLane Corp., 33 W. 42 St., New York, 18, N. Y., $185,550, circuit breaker house and duct lines for Myrtle Ave. Line, BROOKLYN, N. Y. Bd. Transportation, 250 Hudson St., New York, 13, N. Y. Grand total $1,105,731. Bids Nov. 24. CD 12/4, under LB.

▲ **American Telephone & Telegraph Co.**, 195 Broadway New York, N. Y. Owner Builds. $2,000,000. constr. TV facilities for Omaha, Neb., via Salt Lake City, Utah to San Francisco, Calif., NEBRASKA, UTAH and CALIFORNIA.

▲ **Wm. Muirhead Const. Co., Inc.**, Box 2012, Durham, N. C., Contract Awarded, $1,284,956. livestock judging pavilion, RALEIGH, N. C. State Fair Assoc., Dr. J. S. Dorton, mgr., Raleigh. Bids Dec. 28. Awarded Jan. 3. CD 1/4, under LB.

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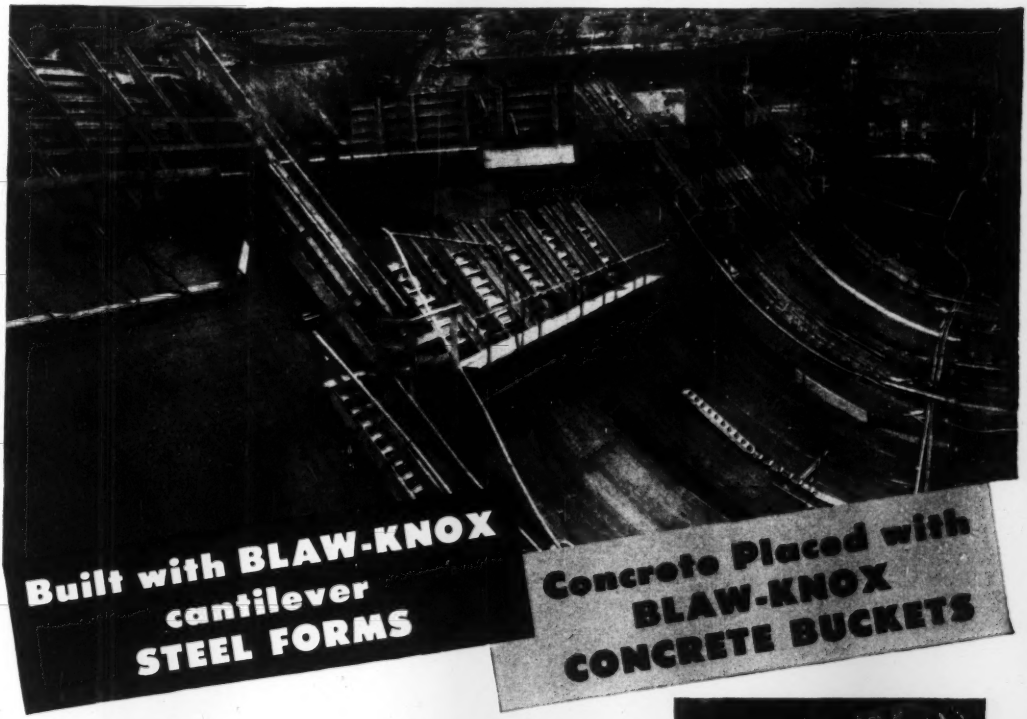

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PROPOSED PROJECTS

WATER SUPPLY

▲ **Calif., San Diego**—City, Civic Center Bldg., expanding water supply, incl. Sutherland Dam, $4,500,000; exten. system reinforcing $1,000,000; University Heights Reservoir North Basin, $400,000; South Basin, $750,000; brine line for Alvarado Filtration Plant, $330,000. Total cost $8,000,000. CD 1/2/46.

▲ **La., Thibodaux**—Lafourche Parish Water Dist. 1, bond election Feb. 5. WW sys. $4,920,000. CD 10/29/45.

Mich., Birmingham—City, P. Wks. Dpt., City Hall, water sys., 12 in. c.i. water mains. $150,000. L. R. Care, City Hall, engr.

▲ **Minn., Richfield**—Village, S. V. Comstock, engr., Village Hall, election Jan. 23 to vote on authorization to construct WW sys. $6,469,899. CD 1/26.

▲ **Tex., Houston**—City, City Hall, 900 Brazos St., San Jacinto River Dam Project, reservoir, $1,585,000; concrete lined canals, $1,286,000; San Jacinto River Water Project, pumping plant, $375,000; San Jacinto Reservoir and Water Project, excess canal and discharge mains, $750,000. Freese, Nichols & Turner, 2111 Natl. Standard Bldg., consult. engrs. CD 11/6.

SEWERS, WASTE DISPOSAL

▲ **Mich., Detroit**—City, Carl D. Warren, comr. Pub. Wks. Dpt., brick, concrete incinerator bldg., equip., Northwest Sect., $1,000,000; East Side Incinerator Plant addn., St. Jean Ave., $500,000. G. R. Thompson, City Hall, city engr. CD 8/8/44.

▲ **Minn., Richfield**—Village, S. V. Comstock, engr., Village Hall, election Jan. 23 to vote on authorization to construct sanitary sewerage sys. $6,772,721. CD 12/9/47.

▲ **N. Y., Buffalo**—Buffalo Sewer Auth., City Hall, Bird Island Sewage Treatment Plant addns. $1,544,000. CD 9/22.

▲ **O., Dayton**—Beaver Creek Sanitary Dist., c/o County Comm., Court House, sewers, sewage lines and disposal plant in Beaver Creek Sanitary Dist. covering 2,867 acres. $1,750,000. Ralph Woolpert Eng. Co., 360 W. 1 St., consult. engr., made preliminary survey. Earl Riber, county sanitary engr.

Ore., Eugene—City, City Hall, sewage treatment plant to serve 50,000 persons. $685,000. Cornell, Howland, Hayes & Merryfield, Corvallis, consult. engrs. W. C. Clubb, city engr. CD 6/27/49.

▲ **Tex., Brownsville**—City, sanitary sewer collection sys. exten., and system pipe line rehabilitation, $566,000; sewage disposal plant, $584,000. Black & Veatch, 4706 Broadway, Kansas City 2, Mo., consult. engrs. CD 12/18.

STREETS AND ROADS

▲ **Delaware**—State Hy. Dpt., Wilmington,
Stage 1—road to connect Delaware River Bridge approach with U. S. Rts. 13 and 40. $4,336,000.
Stage 2—road to connect with Maryland Expressway and proposed bridge over Chesapeake and Delaware Canal. $7,102,000. Knappen Tippetts Abbett Engineering Co., 62 W. 47 St., New York, N. Y., consult. engr.

EARTHWORK, WATERWAYS

▲ **Connecticut**—Connecticut Light & Power Co., 36 Pearl St., Hartford, hydroelectric plant, Housatonic River between New Milford and Lake Zoar. $10,000,000. Charles T. Main, Inc., 80 Federal St., Boston, Mass., consult. engr.

▲ **Wash., Wenatchee**—Puget Sound Power & Light Co., Stuart Bldg., Seattle, Zone 1, raising Rock Island Dam and expanding power plant on Columbia River, near here. $26,000,000. Stone & Webster Eng. Co., Lloyd Bldg., Seattle, consult. engr.

AIRPORTS

▲† **Pa., Phila.**—RESEARCH and TEST FACILITIES—Dpt. Navy, Pub. Wks. Office, Phila. Naval Base, Phila., addnl. research and test facilities at Naval Air Material Center. $1,000,000.

▲† **R. I., Quonset Point**—AIRFIELD—First Naval Dist., 495 Summer St., Boston, Mass., airfield expansion. $3,130,000.

▲ **Tex., Houston**—AIRPORT TERMINAL, etc.—City, municipal airport terminal and admin. bldg. $1,350,000. Wyatt C. Hedrick, 5201 Fanin St., consult. engr. CD 1/24/50.

▲† **Tex., San Antonio**—AIRPORT IMPVS.—Dpt. Air Force, Pentagon Bldg., Wash., D. C., Kelly Field Air Force Base imprvs., Proj. 1, $5,093,000; Proj. 2, $3,043,000. CD 12/15/49.

▲† **Tex., San Antonio**—AIRPORT IMPRVS.—Dpt. Air Force, Pentagon Bldg., Wash., D. C., Lackland Air Force Base imprvs. $4,742,000.

▲† **Tex., San Antonio**—AIRPORT IMPRVS.—Dpt. Air Force, Pentagon Bldg., Wash., D. C., Randolph Field Air Force Base imprvs. $3,513,000.

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PUBLIC BUILDINGS

▲ **Calif., Bakersfield**—HIGH SCHOOL—Kern County Union High School Dist., 1341 F St., plans by C. B. Alford, Haberfelde Bldg., high school, near Chester and Douglas Sts. 2 story admin. bldgs., others 1 story. $2,500,000. CD 11/23/45.

▲ **Calif., Los Angeles**—MEMORIAL HALLS, etc.—Bd. Regents University of California, 405 Hilgard Ave., plans by Welton Becket, 3657 Wilshire Blvd.; Dykstra Memorial Halls, Approx. $1,000,000; plans by Austin, Field & Fry, 2311 W. 3 St., faculty club $1,000,000; plans by Spencer & Landon, 1924 Hilhurst Ave., laundry, Approx. $100,000. CD 8/24/44.

▲ **Calif., Los Angeles**—CIVIC AUDITORIUM, etc.—City Council, City Hall, civic auditorium and music center, $35,000,000.

▲ **Ga., Savannah**—SCHOOL IMPRVS.—Chatham Co. Bd. Educ., Savannah, bond election Jan. 23, school imprvs. $2,500,000. CD 11/26/47.

▲ † **Ill., Granite City**—BARRACKS, etc.—U. S. Eng., U. S. Engineers Depot, Granite City, 2 barracks, warehouses, storage bldg., roadways, utilities, addnl. facilities for U. S. Engineers Depot, $5,362,490.

▲ **Ill., Libertyville**—SCHOOL—Dist. 120, 416 W. Park St., plans by Childs & Smith, 20 N. Wacker Dr., Chicago, Zone 6, high school addn. $1,000,000.

▲ **Ind., Fort Wayne**—PARKING PROGRAM—City, parking program, 2 story 375-car garage, 2-story 108-car garage, ground level parking lot for 108 cars in downtown area, $1,842,000.

▲ **Mass., Boston**—GARAGES—City, Real Estate Comn., City Hall Annex, Unit 5, underground garage, Fort Hill Square, Oliver and High Sts., $1,250,000; Unit 6, 27,173 sq. ft. cage type garages, Old Youngs Hotel area, Court and Franklin Sts., $1,250,000; Unit 8, 43,793 sq. ft. cage type garage, Bellerica Minot and Nashua Sts., $1,250,000. Chas. A. Maguire & Assoc., 294 Washington St., consult. engrs. CD 11/27.

▲ **N. J., Camden**—SCHOOLS—Bd. Educ., Central High Square Camden, schools to replace Cassady, Parkside, Sewell and Whittier, $1,785,000; Senior High School, $1,250,000; school to replace Burrough Junior High, McKinley & Central & Stevens Schools and another elementary school in 13th Ward, $2,315,000; overhaul and expand school bldgs. $7,785,000.

▲ **O., Dayton**—HIGH SCHOOL—Bd. Educ., 232 N. Main St., plans by Ray Yount, 419 Third Natl. Bldg., and Rial T. Parrish, U. B. Bldg., vocational high school, 118 E. First St. $1,900,000. CD 5/9.

▲ **O., Toledo**—LIBRARY, etc.—University of Toledo, Bancroft St., plans by Bellman, Gillett & Richards, 518 Jefferson St., library and law bldg. $1,645,000. CD 12/26/45.

▲ **O., Xenia**—COTTAGES, etc.—Board Trustees, Ohio Soldiers' & Sailors' Orphans Home, Xenia, replacing 5 brick cottages; new maintenance bldg.; remodel gymnasium in McKinley Bldg. $1,200,000.

▲ **Ore., Portland**—SCHOOL—School Dist. 1, 631 N. E. Clackamas St., plans by Barrett & Logan, 1940 S. W. 4 St., remodel Jefferson High School and construct new wing. $2,000,000. CD 6/1/44.

▲ **Pa., Pittsburgh**—HOUSING—Pittsburgh Housing Auth., City County Bldg., plans by Mitchell, Ritchey & Dowden, 524 Fourth Ave., 250 three story apartments, 1,700 units and 1,470 unit row houses. $5,500,000.

▲ **Tex., Dallas**—HOUSING—Dallas Housing Auth., City Hall, plans by Walter W. Cook & Assoc., 9003 Denton Dr., 500 apartment units, $3,750,000. CD 12/2/49.

▲† **Tex., Mineral Wells**—MILITARY—U. S. Eng., 1127 T and P Bldg., Fort Worth, military construction at Camp Wolters. $3,280,000.

▲† **Va., Fort Eustis**—BARRACKS, etc.—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., four 225-man barracks, organization motor pool, post railway exten. and 412 housing units. Approx. $14,000,000.

▲ **Wash., Vancouver**—SCHOOL—School Bd., Vancouver, plans by D. W. Hilborn, Vancouver; Senior High School, $1,500,000. CD 6/16.

▲ **Wis., Wauwatosa**—HOSPITAL—Milwaukee County Institutions & Dpts., plans by Brust & Brust, 135 W. Wells St., Milwaukee, county hospital addn. $10,000,000. Schmidt, Garden & Erickson, 104 S. Michigan St., Chicago, Ill., assoc. archts. H. E. Rumpf, 8731 Watertown Rd., Wauwatosa, engr. CD 6/23, under LB.

COMMERCIAL BUILDINGS

▲ **Calif., San Francisco**—OFFICE—World Trade Center, Inc., 814 Financial Center Bldg., plans by Wm. G. Merchant, 57 Post St., Type 1, six 8 story office and display areas. $5,000,000. 1st unit of proposed $75,000,000 World Trade Center. CD 7/12/45.

▲ **Ill., Evergreen Park (Br. Chicago)**—RESIDENCES, etc.—Wiegel & Kulgalion, 3615 W. 95 St., Evergreen Park, residences, shops, etc., on 160 acre site, 95 to 91 Sts., Crawford to Kostner Sts., near here. $1,000,000.

▲ **La., New Orleans**—HOTEL, etc.—Westminster Hotel, c/o August Perez & Assoc., archts., Audubon Bldg., 18 story hotel and office. $1,500,000.

▲ **Mich., Port Huron**—HOSPITAL—Sisters of Mercy Hospital, Port Huron, brick, steel, concrete hospital. $1,600,000.

▲ **Mo., Clayton (St. Louis 24, P. O.)**—OFFICE—Brown Shoe Co., 1600 Washington Ave., St. Louis, Zone 3, 2 story, bsmnt., rein.-con., brick, steel office on site 450x850 ft., Maryland Ave. between Gay Ave. and Topton Way. Site changed. $1,500,000. CD 6/5, under Mo., St. Louis.

▲ **Mo., St. Louis**—APARTMENT—Owner, c/o Glick R. E. Co., 9125½ Maryland Ave., Clayton, St. Louis, Zone 24, 15 story, bsmnt., penthouse, brick, concrete, steel apartment on 125x246 ft. site. 4620 Lindell Blvd. $3,000,000.

▲ **N. Y., Brooklyn**—APARTMENT—Dworman Co., Inc., 215 Montague St., Zone 2, plans by Morris Rothstein & Son, 185 Joralemon St., Zone 2, 6 story apartment 364 families, 2214-84 Burnett St. $2,750,000.

▲ **N. Y., Brooklyn**—APARTMENTS—Matroland Building Co., Inc., 2938 Avenue X, Zone 29, plans by Morris Rothstein & Son, 185 Joralemon St., Zone 2, 6 story apartment for 108 families, 2414-72 Haring St. $918,000; 6 story apartment for 240 families, 2413-79 Haring St. $2,160,000.

▲ **N. Y., Jamaica**—APARTMENTS—Samuel Minskoff & Sons, 521 Fifth Ave., New York, Zone 17, plans by Albert E. Schaefer, 527 Fifth Ave., New York, Zone 17, four 6 story apartments, to be called Briarwood Gardens, Burden Crescent and 84 Dr. $1,738,000.

▲ **O., Akron**—HOSPITAL—Bd. Trustees, Peoples Hospital, 256 W. Cedar St., hospital. $3,756,000. CD 11/9/44.

▲ **Tex., Dallas**—OFFICE—Fidelity Union Life Insurance Co., 912 Commerce St., 20 story, bsmnt. office. $2,250,000. Wyatt C. Hedrick, 904 Fort Worth Ave., consult. engr. and archt.

▲ **Tex., Houston**—HOTEL—M. M. Feld & Mrs. S. Kaplan, 2215 Dumble St., hotel, off S. Main St. $2,000,000.

▲ **Wash., Fort Lewis**—HOUSING—U.S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, construct, finance and design 750 housing units. $5,000,000.

INDUSTRIAL BUILDINGS

▲ **Ark., Osceola**—PLANT—Crompton Co., c/o Robert & Co. Assocs., archts., 98 Poplar St. N. W., Atlanta, Ga., textile plant, $2,000,000. CD 10/26.

▲ **Calif., Niles**—PLANT—Pacific States Steel Corp., Alvarado-Niles Rd., plant addns. $2,500,000.

▲ **Ga., Atlanta**—MILL—Atlantic Steel Co., Mecaslin St. N.W., mill adn. $1,500,000.

▲ **La., Baton Rouge**—PLANT—Kaiser Aluminum & Chemical Corp., Airline Hy., aluminum plant expansion. $3,000,000.

▲ **Mich., Trenton**—PLANT—Chrysler Corp., 341 Massachusetts St., Detroit, V-8 engines plant, $10,000,000.

▲ **Mo., Springfield**—PLANT—Springfield Ice & Refrigeration Co., 1301 E. Commercial St., plant addn. $1,000,000.

▲ **N. J., Paulsboro**—PLANT—National Steel Corp., Grant Bldg., Pittsburgh, Pa., steel plant on 2,000 acre site, on Delaware River, near here.

▲ **N. J., Trenton**—PLANT EXPANSION—Roller Bearing Co. of America, Whitehead Rd., plant expansion, facilities, $1,453,961.

▲ **N. C., Wadesboro**—MILL—Wadesboro Mill Div. of Burlington Mills Corp., Wadesboro, mill addn. $1,000,000.

▲ **Pa., Ellwood City**—PLANT—Aetna-Standard Eng. Co., Ernest E. Swartswelter, pres., Home Saving and Loan Bldg., Youngstown, O., two all-steel bldgs., one an addn. to machine shop, other an assembly bldg.; remodel third bldg. into modern foundry. $2,000,000.

▲ **Pa., Midland**—PLANT—Crucible Steel Co. of America, Midland, expansion and imprvs., rebuilding 11 O. H. Furnaces, construct blast furnace and 30 coke ovens. $26,000,000.

▲ **S. C., Aiken**—POWER PLANT—South Carolina Electric & Gas Co., 328 Main St., Columbia, electric power plant. $12,000,000.

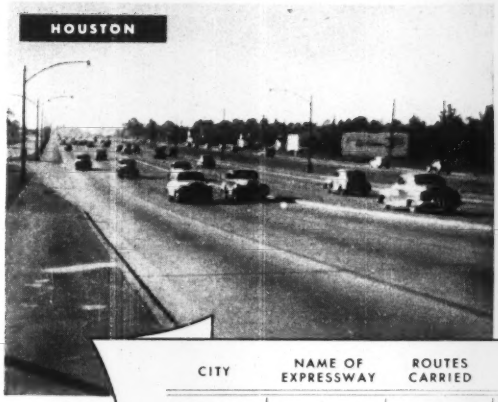
▲ **Tex., Beaumont**—PLANT—Kaiser Aluminum & Chemical Corp., Airline Hy., Baton Rouge, La., aluminum plant. $70,000,000.

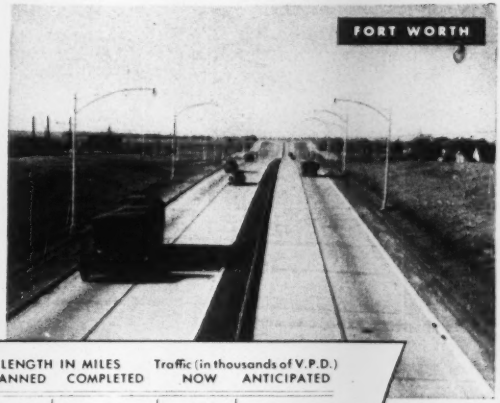
UNCLASSIFIED

▲ **California**—RURAL DISTRIBUTION LINES—Sacramento Municipal Utility Dist., 210 K St., Sacramento, 410 mi. rural distr. line 25 mi. 67 kv transmission lines, addnl. sub-station capacity and sys. imprvs., Sacramento Co. $3,925,000.

▲ **South Dakota**—GENERATING FACILITIES—Rushmore G. & T. Electric Co-operative, Rapid City, generating facilities, incl. 10,000 kw. steam generating plant, Pennington Co. $2,164,000.

▲ **South Dakota**—RURAL DISTRIBUTION LINES—West Central Electric Co-operative, Murdo, 2,032 mi. rural distr. lines, 34 mi. 69 kv transmission line and sys. imprvs., Lyman Co. $3,975,000. Ulterg Eng. Corp., 1114½ Front St., Fargo, N. D., consult. engrs.





CITY	NAME OF EXPRESSWAY	ROUTES CARRIED	LENGTH IN MILES PLANNED	LENGTH IN MILES COMPLETED	Traffic (in thousands of V.P.D.) NOW	Traffic (in thousands of V.P.D.) ANTICIPATED
Houston	Gulf Freeway	U.S. 75	7.5	5.5	65	90
Fort Worth	North-South	U.S. 81	16.6	2.08	10	50
San Antonio	San Antonio Urban	U.S. 81, 87, 90, 181, 281	15	5.39	23	35
Dallas	Central	U.S. 75	11	4.08	26	60

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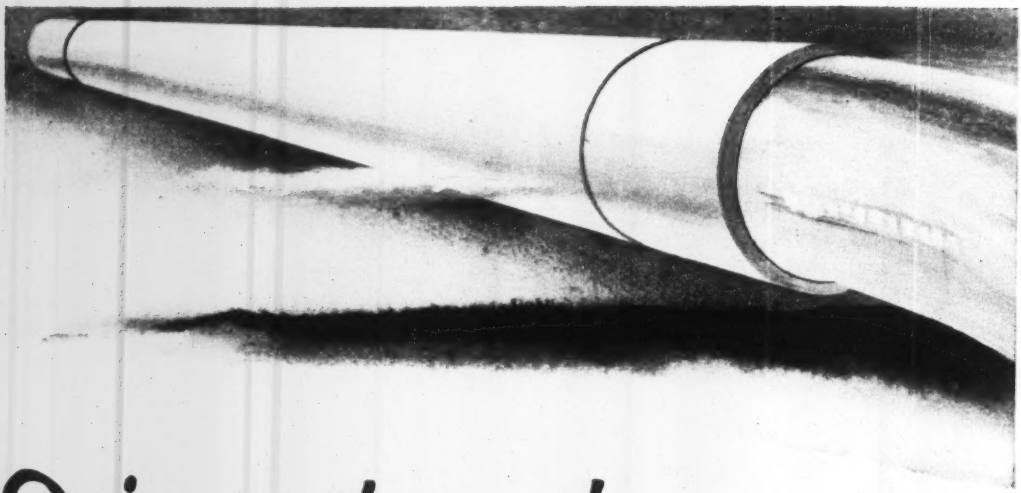

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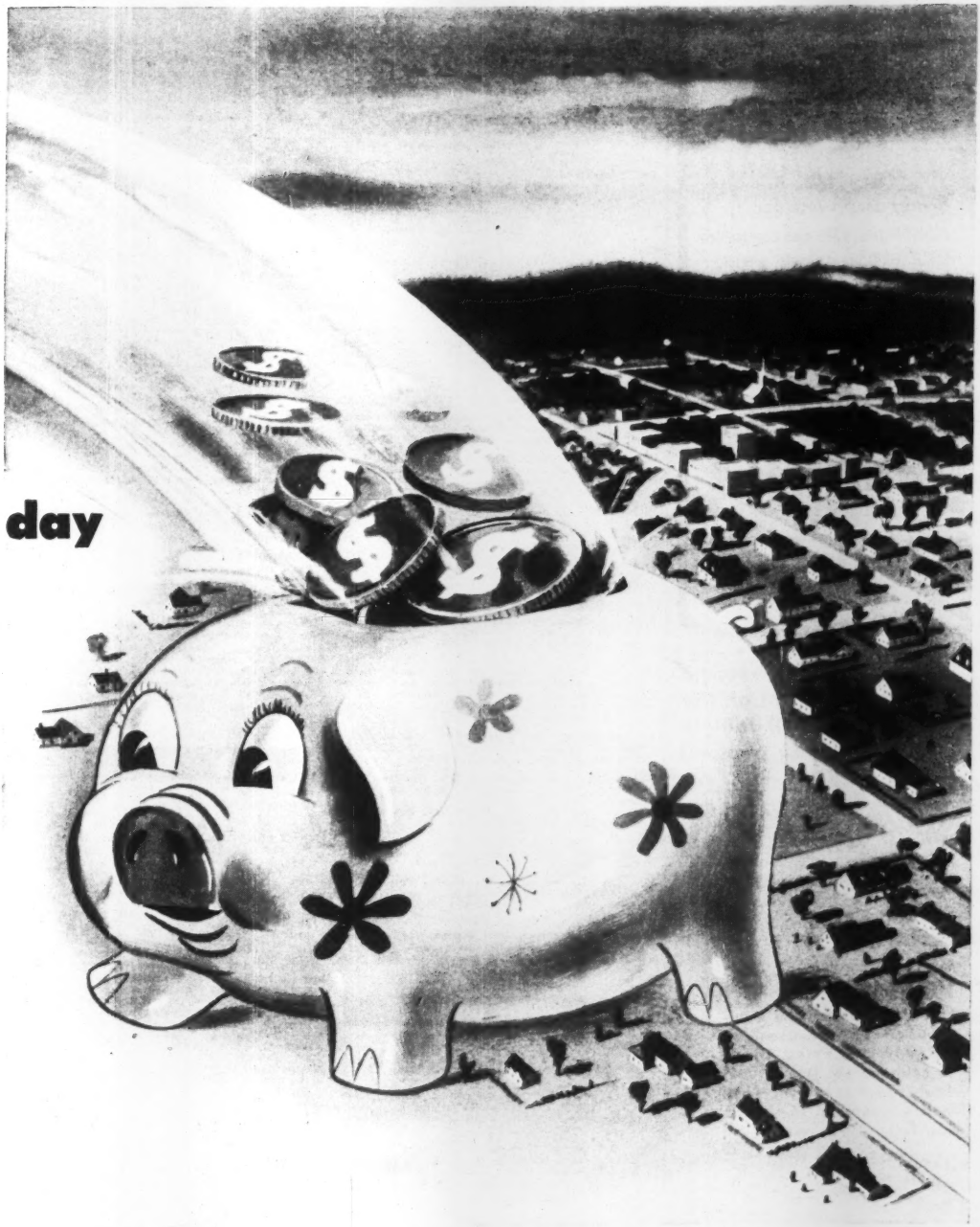

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CONSTRUCTION REPORTS—Second Section

WATER SUPPLY

BIDS ASKED

† **R. I., Providence**—B. A. 1/23—Pub. Wks. Office, First Naval Dist. Headquarters, 495 Summer St., Boston, Mass., water line repairs on Pier No. 2 at the U. S. Naval and Marine Corps Reserve Training Center. Spec. No. 25874.

Md., Sykesville—B.A. 1/25—State Dpt. P. Imprvs., 506 Park Ave., Baltimore, Zone 1, water and sewer extensions, road drainage at Springfield State Hospital, $240,000. Plans deposit $10 each, Whitman, Requardt & Assoc., 1304 St. Paul St., Baltimore, Zone 2, engrs. CD 12/7, under public bldgs.

Calif., Live Oak—B. A. 1/31—City, City Hall, installing water mains for distribution system; 50,000 gal. elevated steel tank. Plans deposit $10. each. Macabee Eng. Co., 156 University Ave., Palo Alto, engr. CD 3/2/47.

LOW BIDDERS

R. J. Hastings & L. J. Stiers, 4903 Delmar Blvd., St. Louis, 12, Mo., Low Bidder, **$163,800,** transmission and distr. water lines, appurtenances incl. 105,800 lin. ft. 2- 8-in. mains. CAHOKIA, ILL., Commonfields of Cahokia Public Water District of St. Clair Co., Ill., Philip G. Listeman, atty., 324 Missouri Ave., East St. Louis, Ill. Bids Jan. 4. CD 12/27.

Clement Betpouey Jr. & Co., Canal Bldg., New Orleans, La. Low Bidder. **$44,873.** WW imprvs., GRAMERCY, LA., Village of Gramercy. Bids Jan. 4. CD 12/13.

Layne—Texas Co., 6419 Maple St., Dallas Tex., Low Bidder, **$39,040.** deep gravel water supply well, BONHAM, TEX. City, Bonham, Wisenbaker, Fix & Assoc., 1415 N. Dixie St., Tyler, engrs.

Rockwell Mfg. Co., 1102 Delano St., Houston, Tex. Low Bidder, **$93,750.** est. $98,000. water meters. HOUSTON, TEX. City, City Hall, 900 Brazos St. Frank Baldwin, Pub. Wks. Eng. Bids Jan. 8.

F. M. Reising Const. Co., Edinburg, Tex., Low Bidder, $87,775. est. $75,000. WW, LOS FRESNOS, TEX. City, Los Fresnos. Bids Dec. 27. CD 12/6.

CONTRACTS AWARDED

Brennan & Cahoon, Pocatello, Idaho, Contract Awarded, $72,599 excavating, trenching three mi. 30-in. pipe line for city water supply TWIN FALLS, IDAHO. City. CD 11/3.

Boam Co., 16240 Northwestern St., Detroit, Mich. Contracts Awarded. **$280,675.** Contr. 50-T-1, 6-to 30-in. water main, valves, hydrants, etc., ROYAL OAK, MICH., City City Clk., City Hall, Royal Oak, Mich. Bids Nov. 20. CD 10/26.

City, Daingerfield, Tex., Force account. Approx. $31,000. est. $30,000. water lines, DAINGERFIELD, TEX. Bids Oct. 16. Awarded Jan. 2. CD 9/26.

Theo. Janek, Eagle Pass, Tex., Contract Awarded, **$56,600.** est. $105,000. water main extens. and appurtenances incl. 33,600 lin. ft. 6 to 10 in. c.i. pipe, EAGLE PASS, TEX. city, Eagle Pass. Bids Oct. 5. Awarded Dec. 22. CD 9/20.

Beaumont Place, Inc., Scanlan Bldg., Houston, **Tex. Own forces. $35,000.** water lines, facilities. near HOUSTON, TEX.

City, City Hall, 900 Brazos St., Houston, **Purchase and Hire. $75,000.** c.i. water mains, in 90 mi. area recently annexed. HOUSTON, TEX. L. Fugate, city engr. CD 6/14/49.

Home Owned Properties, Inc., Scanlan Bldg., Houston, Tex. Own forces. $63,145 water lines, facilities. HOUSTON, TEX. Atkinson & Atkinson, 1st. Natl. Bank Bldg., engrs.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Mich., Monroe—B.A. 1/22—City, D. A. Soleau, city clk., City Hall, storm drain, sanitary sewer, excav. 15,000 cu. yd. earth, 600 cu. yd. rock, 2,836 lin. ft. 24 in. concrete pipe line and encasement, 2,500 ft. 8 in. concrete pipe street crossing head walls, appurtenances, etc. Plans deposit $10 refundable. CD 11-21-44.

Tex., Dallas—B.A. 1/30—City, City Hall, Main and Harwood Sts., storm sewers, along Coombs Creek, $60,000; Knights Branch, Thurston to Denton Sts. $79,000; Oaklawn Dr., Harry Hines Blvd. to Maple St., $163,000. J. T. Conroy, Pub. Wks. Eng. CD 6/26.

LOW BIDDERS

Charles Capone Co., 44 Wellsmere Rd., Roslindale, Mass. Low Bidder, **$75,034.** c.i. rein.-con. culvert pipe, Dedham and Canton, MASSACHUSETTS, Commonwealth of Mass., M. D. C., 20 Somerset St., Boston. Bids Dec. 14.

F. M. Reising Const. Co., Edinburg, Tex., Low Bidder, $62,736. est. $60,000. sanitary sewers, LOS FRESNOS, TEX. City, Los Fresnos. Bids Dec. 27. CD 12/6.

H. T. Barry Const. Co., 4100 Old Spanish Trail Rd., Houston, Tex. Low Bidder. **$211,503.** est. $220,000. enlarging existing sewer mains and new lines, NACOGDOCHES, TEX. City, Nacogdoches. Bids Dec. 29. CD 12/19.

R. L. Moss & Co., Zenith, Wash., Low Bidder, **$125,890,** 32,048 ft. 6- to 12-in. sewers in Local Improvement Dist. 71-S, East Vancouver, VANCOUVER, WASH. City, City Hall. Bids Jan. 3. CD 12/21.

CONTRACTS AWARDED

M. Miller Co., 877 N. Bunker Hill Ave., Los Angeles, Calif., Contract Awarded, **$80,000,** sanitary sewers in Tract 16887, LOS ALAMITOS, CALIF. Metz-Aldon Inc., 13421 San Antonio Dr., Norwalk, Calif. Engineering Service Corp., 1489 W. Washington St., Los Angeles, Calif., engr. Awarded Jan. 2.

Haddad Constr. Co., 3398 Sullivant Ave., Columbus, O., Contract Awarded, **$242,152.** est. $169,373, storm relief sewer No. 1673, Homeville Dist., using concrete pipeline from 24 to 54 in. TOLEDO, O. City, City Hall. Bids Jan. 3. Awarded Jan. 5. H. Nelson, city sewer div. engr.

Banta Const. Co., 1646 W. Main St., Oklahoma City, Zone 4, Contract Awarded, **$220,107.** est. $230,000. storm sewer Contract 12, northwest part of city, OKLAHOMA CITY, OKLA. City, City Hall, Zone 2. Bids Dec. 5. CD 11/29.

City, Bellaire, Own forces. $70,000. storm sewer lines, BELLAIRE, TEX. City, Bellaire, J. E. Noser, Bellaire, engr. CD 11/15.

City, Eagle Lake, Tex., Purchase and Hire. Approx. $65,000. sanitary sewer lines, EAGLE LAKE, TEX. CD 10/6/49.

Beaumont Place, Inc., Scanlan Bldg., Houston, Tex. **Own forces. $61,500.** sanitary sewers, near HOUSTON, TEX.

Home Owned Properties, Inc., Scanlan Bldg., Houston, Tex., Own forces. **$68,500.** sanitary sewers***Joe S. Johnston Co., Gregory Rd., Houston, Tex., Contract Awarded. Approx. $73,500.** storm sewers, grading, clearing, HOUSTON, TEX. Atkinson & Atkinson, 1st. Natl. Bank Bldg., engrs.

R-W. Constr. Co., 4831 W. State St., Milwaukee, 8, Wis., Contract Awarded, **$71,486,** sewers N. 2 St. ***L & L Service Co., 906 E. Center St., Zone 12, $79,220,** W. Custer Ave ***Otto P. Seefeld Inc., 3097 W. Mill Rd., Zone 9, $91,663,** S. Baay St. MILWAUKEE, WIS., City. Bids Dec. 18 and Dec. 27. Grand total, $242,369.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

January 23 — Iowa
January 24 — Louisiana
January 25 — Virginia

N. Y., New York—B.A. 1/24—Dpt. P. Wks., Municipal Bldg., Zone 3, Contr. No. 3, Unionport Bridge substructures and superstructures, north unit. Plans deposit $5. Extended date. CD 12/14.

LOW BIDDERS

Montgomery Constr. Co., Montgomery, Ala. Low Bidder. **$73,682,** bridges from Pickensville northwest to Mississippi State line, Pickens Co.; **Vandigriff Constr. Co.,** 4708 N. Court St., Montgomery, Ala., **$196,300,** bridges 3.75 mi. on road from Georgiana toward Brently, Butler Co., ALABAMA. State Hy. Dept., Montgomery. CD 12/29.

Camden Constr. Co., 1301 Towson St., Baltimore, Md. Low Bidder. **$78,063.** wid'n. of 5 bridges, north and south of Clinton, Contr. P 673-1-515, Prince Georges Co., MARYLAND, State Rds. Comn., Baltimore, Zone 2. Bids Dec. 19. CD 12/5.

CONTRACTS AWARDED

† **Allied Contractors, Inc.,** 204 E. Preston St., Baltimore, Md. Contract Awarded. **$509,665.** rein. conc., structure and approaches 0.109 mi., Baltimore-Washington Parkway, Proj. 1F2, Prince Georges and Anne Arundel Counties, MARYLAND, Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va. Awarded. Jan. 5. CD 12/1 under L. B.

W. R. Fairchild Constr. Co., Box 127, Hattisburg, Miss. Contract Awarded. **$112,758.** Bridge across Bouie River on Rawl Springs-Maybanks Rd., HATTIESBURG, MISS., Forrest Co. Bids Jan. 4.

Alfred Mousseau, Ste. Genevieve, Que., Contract Awarded, $100,000 bridge over Bayonne River, QUEBEC, Providence of Quebec, Quebec City. CD 11/29.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

January 23
Iowa
Nevada
January 25
Virginia
January 26
Kansas
Missouri

January 30
New Jersey
January 31
Kansas
February 1
California
February 7
Louisiana

LOW BIDDERS

Clyde O. Mitchell Constr. Co., 104 N. 44 St., Birmingham, Ala., Low Bidders, $216,250, roadway, bit. tr., 9.242 mi., from Pickensville Northwest to Mississippi State Line, Pickens Co.; $238,078, grading, drainage 12.494 mi. Hanceville-Arkadelphia Rd., Cullman Co.; $88,735 grading, drainage 6.398 mi. from Ala. Hy. 25 (near Montevallo) southeast, Shelby and Chilton Counties***Joe F. Walters**, Troy, Ala., $88,735, drainage, single surf. tr., 9.395 mi. from Belleville to Castleberry, Conecuh Co.; $80,411, bit. 6.785 mi. on county road from the Houston Co. line south to Ala. Hy. 12 east of Hartford, Geneva Co.***Reynolds & Shaw Co.** Clio, Ala. $79,796, bit. 27.24 mi. from Elba northeast, Elba northwest and Banley Cross Rds. West, Coffee Co.***Vandigriff Constr. Co.**, 4708 N. Court St., Montgomery, Ala. $446,037, grading drainage 12.24 mi. on part of Decatur-Moulton Rd., Lawrence Co.***Bennett Constr. Co.**, Montgomery, Ala., $67,202, temporary surf. 4.665 mi. on road from U. S. Hy. 31 to Ala. Hy. 14 (Prattville Cutoff), Autauga Co. ALABAMA. State Hy. Dpt., Montgomery. Bids Jan. 5. CD 12/29.

Oilfields Trucking Co., and Phoenix Constr. Co., 1601 S. Union Ave., Bakersfield, Calif., Low Bidder, $84,447 plant mix surf., 6.9 mi. Weed Patch-Wheeler Ridge Rd., between David Rd. and Wheeler Ridge, Kern Co., CALIFORNIA State Div. Hys., P. Wks. Bldg., Sacramento. Bids Jan. 3. CD 12/11.

† U. S. Eng., P. O. Box 2316, Boston 7, Mass. rejected bids Dec. 6. repair of grade skirting Fairmount Terrace Housing Proj. 19-016-51-30, BANGOR, ME. CD 11/21.

† **Ed Tangmo**, Milltown, Mont., Low Bidder. $83,574, grading, surf., oiling 2.8 mi. of Clark Fork Hy. west of Thompson Falls, MONTANA, Bureau P. Rds., Commerce Dpt., P. O. Bldg., Missoula. Bids Jan. 4. CD 12/21.

▲ **John C. Peterson Constr. Corp.**, 958 Church St., Baldwin, N. Y. Low Bidder, $2,457,019, width 2 mi. sect. of Grand Central Parkway extens., Queens Co. NEW YORK. Bureau Contracts & Accounts, Albany. Bids Jan. 10. CD 12/27.

CONTRACTS AWARDED

Boh Constr. Co., 2400 Cypress St., New Orleans, La. Contract Awarded, $441,290. Proposal 16,054, subsurf. drainage on Wisner Blvd. from Beauregard Monument to Desaix Bridge and Esplanade Ave., Florida Ave., Proposal 16,056, temporary surf. of streets in Gentilly Village subdivision, Proposal 16,041, conc. and asph. paving on Saratoga St. from Poydras St. to Girod St., Proposal 16,042, conc. and asph. paving on Wisner Blvd. from Beauregard Monument to Desaix bridge.***Texas Bitulithic Co.**, Burma Rd., New Orleans, La. $122,695. Proposal 16,055, surf. and resurf. asph. (black topping) existing roadways in west section, Proposal 16,043, resurf. with asph. of Leonidas St. from S. Clairborne Ave. to Pritchard St. from Leonidas St. to Monroe St., Proposal 16,044, resurf. with asph. of St. Roch Ave. from Chartres St. to Dauphine St., Proposal 16,045, resurf. with asph. of St. Roch Ave. from Marais St. to Roman St.***NEW ORLEANS, LA., City Purchasing Div., City Hall. Bids Dec. 21.

▲ **Dinardo, Inc.**, 331 Bouquet St., Pittsburgh, Pa., Contract Awarded, $2,761,657. construct divided hy. consisting of rein.-con. pavement 24 ft. wide on each side of a concrete divisor area 4 ft. wide and three concrete deck plate girder and I-beam viaducts; construct approach ramps consisting of rein.-con. pavement 18 ft. and variable in width, rein.-con. retaining wall and one through plate girder viaduct, all within an over-all length of 1,716 ft. Total length 2.763 ft. L. R. 765 (3B, 4B). T. R. 22, 30. A sect. of the Penn-Lincoln Parkway, west, Allegheny Co. PENNSYLVANIA. State Hy. and Bridge Auth., 504 N. Office Bldg., Harrisburg. Bids Dec. 8. CD 12/12, under LB.

Beaumont Place, Inc., Scanlan Bldg., Houston, Tex. Own forces. $60,000 street const. and asph. paving, near HOUSTON, TEX.

Joe S. Johnston Co., Gregory Rd., Houston, Tex. Contract Awarded, $115,000 street const. and asph. paving, HOUSTON, TEX. Home Owned Properties, Inc., Scanlan Bldg. CD 4/19.

Charles Duranceau Ltd., 2545 Jacques Hertel, Montreal, Que., Contract Awarded, $103,596, pavement and sidewalk Linton Ave. from Cote des Neiges Road to Victoria Ave.***Frank Lapan Ltd.**, 7725 Souligny St., Montreal, Que., $103,520, pavement and sidewalk, on 11 Ave., St. Zotique to Belanger, Bernard Blvd., and Duquense St.; to **Alexander Duranceau Ltd.**, 4 E. Notre Dame St., Montreal, Que., $87,920, pavement and sidewalk MacDonald Ave. from Dupuis Ave. to north limit of city; Niron Constr. Ltd., 2201 Cote St. Michael Rd., Montreal, Que., $74,411, pavement and sidewalk Hamel Ave. and Decaile Ave., MONTREAL, QUE. Municipality. Grand total, $369,447. CD 8/8.

EARTHWORK, WATERWAYS

BIDS ASKED

† **Texas**—B.A. 1/24—U. S. Eng., 606 Santa Fe Bldg., Galveston, dredging for Gulf Intracoastal Waterway. Inv. No. CIVENG 41-243-51-54. $80,000. Plans deposit $25. CD 6/9/44.

† **Indiana**—B.A. 1/30—U. S. Eng., 830 West Broadway, Louisville, 3, Ky. levee embankment, 14,500 cu. yds. Young and Neal Levee Repairs Fountain Co., CIVENG-15-029-51-73. CD 4/21/44.

† **Indiana**—B.A. 1/31—U. S. Eng., 830 W. Broadway, Louisville, 3, Ky. levee embankment, 31,000 cu. yds. Granny Tweedle Levee Repairs, White Co., CIVENG-15-029-51-89. CD 4/21/44.

† **Alaska**—B.A. 1/31—U. S. Eng., (APO 942, c/o PM Seattle, Wash.) Anchorage, construct natural timber fascine for emergency bank protection, Talkeetna. CIVENG 95-507-51-1. Plans deposit $10.

LOW BIDDERS

† **MacDonald & Kruse**, 7540 Wheatland Av., Los Angeles, Calif., Low Bidder, $678,464, Compton Creek imprvt. Lanzit Ave. to Main St., ENG 04-353-51-9, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles. Bids Jan. 4. CD 12/14.

† **Morrison Eng. & Contg. Co.**, New Roads, La., Low Bidder. $41,389. constr. Lamoure Control Structure, consisting of gated rein.-conc. culvert. Inv. 51-96, Rapides Parish, LOUSIANA, U. S. Eng., Foot of Prytania St., New Oreans, La. Bids Dec. 21. CD 11/28.

† U. S. Eng., 601 Davidson Bldg., Kansas City, Mo. cancelled bids to have been opened Jan. 9. constr. pressure relief well sys., Levee Unit 488-L along the left bank of Missouri River in Holt Co., near Forbes, CIVENG 23-028-51-56, MISSOURI. Will re-advertise. CD 12/13.

† U. S. Eng., 601 Davidson Bldg., Kansas City, Mo. cancelled bids to have been opened Jan. 11, contr. levee unit 448-443-L, Cloverdale Drain Sect. approx. 8 mi. southwest of St. Joseph, CIVENG 23-028-51-58. MISSOURI. Will re-advertise. CD 12/10.

† **Vierling Steel Works**, 53 W. Jackson St., Chicago, Ill. Low Bidder. $68,290. structural steel for spillway bridge at Canyon Ferry Dam. Missouri River Basin Proj. Spec. DS 3256, MONTANA, Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo. Dec. 28. CD 12/2.

† **Lee Moor Contrg. Co.**, 205 Bassett Tower, El Paso, Tex., Low Bidder, $47,797, construct Lucero Arroyo Dike, Wasteway Channel and structures, Rio Grande Project, near Las Cruces, NEW MEXICO. Spec. DC-3249. Bureau Reclamation, Dpt. Interior, Elephant Butte. Bids Dec. 19. CD 12/5.

† **General Electric Co.**, 421 Clark St., Pasco, Wash., Low Bidder, $959,285, electric equipment for McNary Dam. CIVENG 45-164-51-30. OREGON. U. S. Eng., 19 E. Poplar St., Walla Walla, Wash. Bids Jan. 3. CD 1/10, under LB.

U. S. Eng., Customhouse, Charleston, S. C., rejected bids Oct. 19, maintenance dredging of Sampit River, Georgetown Harbor CIVENG 38-081-51-2. SOUTH CAROLINA. L. B. $274,229. CD 10/24.

† **Atkinson Dredging Co., Great Bridge, Va.**, Low Bidder $269,956. dredging Georgetown Harbor, Georgetown Co., SOUTH CAROLINA. U. S. Eng., 33 Customhouse, Charleston. Bids Jan. 4. CD 12/22.

CONTRACTS AWARDED

▲ **Union Constr. Co.**, Northside Dr. Northwest, Atlanta, Ga., Contract Awarded, $14,000,000. Furman Shoals Dam Project, Milledgeville, GEORGIA. Georgia Power Co., 78 Marietta St., Northwest, Atlanta, Ga.

† **Macco Corp.**, 14409 Paramount Ave., Paramount, Calif., Contract Awarded, $519,500, first-stage construction for Albeni Falls Dam on Pend Oreille just across Washington State line, Inv. CIVENG-45-108-51-31, IDAHO, U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4. Bids Jan. 4. CD 1/10, under LB.

† **Treadwell Constr. Co.**, Midland, Pa., Contract Awarded. $126,900. three 12.78 ft. by 21.78 ft. fixed wheel gates for penstocks at Canyon Ferry Dam, Missouri River Basin Proj. Spec. DS 3242, MONTANA, Bureau Reclamation, Bldg. 1-A, Denver Federal Center, Denver, Colo. Awarded Dec. 27. CD 12/29, under LB.

† **Lambert Bros., Inc.**, Bassett, Va., Contract Awarded, $67,250, alterations Fairy Stone State Park Dam, Philpott Reservoir, Smith River. CIVENG 44-110-51-10. VIRGINIA, U. S. Eng., foot of Front St., Norfolk. Bids Sept. 26, Awarded Nov. 3. CD 9/1.

▲ **Northern Constr. Co. of J. W. Stewart Ltd.**, 1304 Harnby St., Vancouver, B. C., Contract Awarded, $1,500,000, 13,000 ft. long, 9 ft. in diam. tunnel, unlined, rock remainder surfaced with steel, concrete or rein.-con., for hydro-electric project. BRITISH COLUMBIA, British Columbia Electric Co., 425 Carrall St., Vancouver. Awarded Jan. 6. CD 11/24.

Lucien Lackapelle, Sorel, Que., Contract Awarded, $39,688. reconstr. breakwaters, STE. ANNE DE SOREL, QUE. Dpt. P. Wks. Hunter Bldg., Ottawa, Ont. Bids 7/26 rejected. CD 7/26, under LB.

AMERICANS ABROAD

Lewis Foundry & Machine Div. of Blaw-Knox Co., Groveton, Pittsburgh, Pa., U. S. A. Contract Awarded, Approx. $1,000,000. continuous steel strip mill, KOBE, JAPAN. Nichia Steel Works, Ltd., Kobe, Japan.

AIRPORTS

BIDS ASKED

Mich., Detroit—TERMINAL—B.A. 1/22—State, Wayne Co., M. J. O'Brien, chn., Bd. of Co. Rd. Comrs., 5800 Cadillac Tower, substructure and superstructure terminal bldg. and cargo bldg., Detroit-Wayne Major Airport, CAA 9-20-032-008, FM 82-17-C-22. Plans deposit $10 refundable to bidders. Bids 9/26 rejected. CD 9/18/50.

† **Fla., Panama City**—RUNWAYS, ETC.—B.A. 1/30—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., runways, taxiways aprons, lighting facilities at Tyndall Field, Serial No. Eng 01-076-51-131. Extended date. CD 1/8.

LOW BIDDERS

† **F. A. Todd**, 38 E. 16 St., Jacksonville, Fla., low Bidder, $107,276, renovation of four buildings at Patrick Air Force Base, Long Range Proving Grounds, Brevard Co., approx. 16 mi. from here COCOA, Fla. Eng. 08-123-51-8 U. S. Eng., P. O. Box 4970, Jacksonville. Bids Jan. 5 CD 11/28.

† **E. V. Lane, Anchorage, Alaska**, low Bidder, $354,738. est. $278,416, construct complete bulk fuel systems, incl. tank, piping and pumping facilities at ocean dock area. Inv. No. 95-507-51-19. Elmendorf Air Force Base, ALASKA, U. S. Eng. (APO 942, c/o PM, Seattle, Wash.) Anchorage. Bids Jan. 4.

CONTRACTS AWARDED

▲† **George D. Auchter Co.**, foot of E. 59 St., Jacksonville, Fla. Contract Awarded, $1,376,000, renovation of 70 buildings at Naval Air Technical Training Center, N.A.S., JACKSONVILLE, FLA. Bureau Yards & Docks, Navy Dpt., Arlington, Va. Awarded Jan. 5.

Woodworth & Co., 1200 East D. St., Tacoma, Wash., Contract Awarded, $322,588, Sch. A, north-south runway exten. at McChord Air Force Base, TACOMA, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4. Bids Dec. 6. CD 11/28.

† **Morrison-Knudsen-Peter Kiewit Sons Co.**, 1300 Aloha St., Seattle, Wash., Contract Awarded, $113,113, est. $113,692, radiant heating and floor drainage sys. for Bldgs. 212, 216 and 221. Inv. S95-507-51-35, Elelson Air Force Base, ALASKA. Bids Jan. 4. CD 12/28.

▲† **Anderson Constr. Co. and Benson-Montin, Inc.**, Central Bldg., Seattle Wash., Contract Awarded. $9,540,765. nine 200-man barracks at Elelson Air Force Base and one 500 man and six 200-man barracks at Ladd Air Force Base, Inv. S95-507-51-26. ALASKA, U. S. Eng. (APO 942, c/o PM, Seattle, Wash.) Anchorage. Bids Dec. 13. CD 12/19, under LB.

▲ **Pentagon Constr. Ltd.**, 1225 Bisho St., Montreal, Que., Contract Awarded, $1,098,000. radar station, MCARTY (Postal Dist. Rouyn) QUE., Govt. of Canada, Hunter Bldg., Ottawa, Ont. Dpt. National Defence (AIR) Cartier Sq., Ottawa, Ont., archts., Defence Constr. Ltd., 70 Lyon St., Ottawa, Ont., engrs.

PUBLIC BUILDINGS

BIDS ASKED

† **Md., Aberdeen**—RESEARCH FACILITIES—B.A. 1/22—U. S. Eng., First and Douglas Sts. N.W., Wash., D. C., constr. research facilities for air to ground firing of rockets and missiles at Aberdeen Proving Grounds. ENG. 49-080-51-1 (1). CD 11/17.

Mich., Flint—SCHOOL—B.A. 1/23—Bd. Educ., Joseph A. Anderson, secy., 2 story, bsmnt., brick, steel, conc. John L. Pierce Elementary School, $300,000. Louis C. Kingscott & Assoc., Inc., 511 Monroe St., Kalamazoo, archts. CD 8/14.

▲ **Tex., San Antonio**—HOUSING—B.A. 1/23—San Antonio Housing Auth., 419 S. St. Marys St., 204 housing units for total 39 bldgs. for Latin-Americans. $1,515,000. Plans deposit $50. Ford & Rogers, Willow Way; Nayfach-Richey, 715 Alamo Natl. Bldg.; R. H. H. Hugman, 1071/2 W. Commerce St.; John Marriott, 905 Frost Bank Bldg., all San Antonio, archts.; Frank T. Drought, 117 W. Pecan St., engr. CD 6/8.

† **Calif., San Francisco**—BUILDINGS—B.A. 1/24—Dist. P. Wks. Office, Federal Office Bldg., Civic Center, rehabilitation of buildings Nos. 203, 204 and 212 at U. S. Naval Station, Treasure Island, Spec. 26195, Contr. NOY-23870. Plans deposit $10.

▲ **Del., Middletown**—SCHOOL—B.A. 1/24—New Castle County Comprehensive School Bd., Townsend, vocational school, $1,350,000. George E. Pope & Albert Kruse, Elks Bldg., Wilmington, archts.

La., Bossier City—SHOP—B.A. 1/24—State Hy. Dpt., Baton Rouge, two 30x140x12 ft., prefabricated steel distr. headquarters shop bldgs., S. P. 881-01-04 Contr. 3.

Md., Baltimore—SCHOOL—B.A. 1/24—City, R. E. L. Williams, bldg. constr. engr., 410 Municipal Bldg., Zone 2. 1 story, 64x263 ft. stone School 68 addn., Wildwood Pkwy., $400,000. Plans deposit $40, Benjamin Frank 15 W. Franklin St., archt., Van Rensselaer Saxe, 100 W. Monument St., struct. engr., Jas. Posey, 10 E. Pleasant St., mech. engr. CD 8/21.

Ind., Noblesville—SCHOOL—B.A. 1/25—Bd. School Trustees, High School, 1 story 63x284 ft., 54x75 ft. wing, stone, reinforced-con. school, $350,000. Plans deposit $25, McGuire & Shook, 1400-01 Fletcher Trust Bldg., Indianapolis, Zone 4, archts. CD 1/5. Extended date.

Mass., Dedham—SCHOOL—B.A. 1/25—Town of Dedham, School Bldg. Comm., Oakdale Elementary School, $350,000. Kilham, Hopkins, Greeley & Brodie, 9 Arlington St., Boston, archts. CD 4/20/50.

Mass., Needham—SCHOOL—B. A. 1/25—Town of Needham, School Bldg. Comm., High Rock School, $300,000. Plans deposit $25. Rich & Tucker, 45 Newbury St., Boston, archts. CD 9/6/50.

Mass., Stoughton—SCHOOL—B.A. 1/25—Town of Stoughton, School Bldg. Comm., 2 story, bsmt., brick high school addn., alterations, $300,000. Plans deposit $25, Collens, Willis & Beckonert, 20 Newbury St., Boston, archts. CD 8/30.

Pa., Altoona—HOUSING—B.A. 1/25—Altoona Housing Auth., 509 S. 27 St., State Housing Proj. 29, 120 family units, $389,675. Plans deposit $25. Hunter, Caldwell & Campbell, 3601 5 Ave., archts. CD 20/2.

▲ Tenn., Nashville—HOUSING—B.A. 1/25—Nashville Housing Auth., 701 N. 6 St., housing units, Wallace Pk. Extension, Buena Vista, Archie Bds Dec. 14 rejected. L. B. $1,850,546. CD 12/19, under LB.

Ont., Niagara Falls—SCHOOLS—B.A. 1/25—Page & Steele, archts., 72 St. Clair Ave. W., Toronto, Ont., school on Valley Way for Bd. Educ., 677 Ontario St. Plans deposit $50. CD 11/3.

Miss., Fernwood—FACTORY—B.A. 1/26—Pike Co., box factory for Indianapolis Wirebound Box Co., $335,000. Plans deposit $25. Bill Archer and Morris L. McNair, Rosenbaum Bldg., Meridian, archts. CD 21/30 under Industrial Bldgs.

N. Y., Ballston Spa—HOSPITAL—B.A. 1/26—Board of Directors, Benedict Memorial Hospital, Court House, Ballston Spa, general const., plumbing, heating and ventilating, electrical for construction of Benedict Memorial Hospital. Plans deposit $50. Louis E. Jallade, 597 Fifth Ave., New York Zone 17, archt. and engr.

N. Y., Nanuet—SCHOOL—B.A. 1/26—Bd. Educ., Union Free School Dist. 8, Towns of Clarkstown, Orangetown and Nanuet, school addns. and alterations, High-view Ave.

▲ Conn., Hartford—HOUSING—B.A. 1/31—City Housing Auth., 846 Asylum Ave., No. 3-5 low-rent housing incl. 600-units, Kensington and Hampton Sts. $6,000,000. Kane & Fairchild, 49 Pearl St., Hartford, archts. CD 9/25, under LB.

LOW BIDDERS

Stolte Inc., Monterey, Calif., low Bidder, $649,713 Washington Junior High School addns., SALINAS, CALIF., Salinas School Dist., Salinas. CD 6/22.

Cannova Constr. Co., 1938 Harrison St., Hollywood, Fla., Low Bidder, $161,107, garage, HOLLYWOOD, FLA. City. Bids Jan. 2. CD 12/1.

▲ E. F. Shanahan Co., Inc., 7442 S. Vincennes Ave., La Salle, Ill., Low Bidder, $1,715,139, 2 story basmt., 200 unit houses, LA SALLE, ILL., Housing Auth. of LaSalle Co., Ottawa. Bids Dec. 6. CD 11/28.

▲ New Orleans Housing Auth., 1111 Tulane Ave., New Orleans, La., rejected bids Dec. 28, 540 housing units, Proj. LA 1-9, 720 housing units, Proj. LA 1-13, and 244 housing units, Proj. LA 1-11, NEW ORLEANS, LA., L. B. $17,080,000. Will re-advertise. CD 1/4, under LB.

University of Minnesota, R. S. Callaway, purch. agent, 624 Admin. Bldg., Main Campus, Minneapolis, rejected bids Nov. 8, physical education bldg., DULUTH, MINN., L. B. $870,000. CD 11/26 under L. B.

▲ Mutual Constr. Corp., 205 E. 42 St., New York, Zone 17, Low Bidder, $1,013,400, health and physical educ. bldg., POTSDAM, N. Y., New York State Dormitory Auth., Albany. Bids Jan. 3. CD 12/5.

Temple Housing Auth., Temple, Tex., rejected bids Dec. 19, 70 unit housing project, TEMPLE, TEX., L. B. $718,800. CD 12/29, under LB.

Doyle & Russell, Central Natl. Bank Bldg., Richmond, Va., Low Bidder, $921,695, Westmont Avenue Elementary School, NORFOLK, VA. City, Norfolk, Vernon A. Mays, 216 W. 20 St., archt.

▲† L. H. Hoffman, 711 S. W. Columbia St., Portland, Ore., Low Bidder, $2,473,000, est. $2,186,460, 2 steel, concrete, 3 steel-frame, and 3 frame buildings, 46x80 to 24x36 ft., 1 story to 70 ft. high, 33x45-ft., underground concrete crib and underground 30,000 gal. stainless steel tank at Hanford Works, RICHLAND, WASH., General Electric Co., prime contractor to U. S. Atomic Energy Comm. for operation of Hanford Works. Bids Jan. 4. CD 12/28.

CONTRACTS AWARDED

Albert Reingardt, 1825 E. 7 St., Long Beach, Calif., Contract Awarded $978,225, Proj. 3 and 4 elementary schools, DOWNEY, CALIF., Alameda School Dist., 8613 Alameda St., Downey. Bids Dec. 6 awarded Jan. 4. CD 12/14, under LB.

† Tonn & Blank, 104 Franklin St., Michigan City, Ind., Contract Awarded $800,000, reactivation of production lines KINGSBURY, IND., Kingsbury Ordnance Plant. Awarded Jan. 3.

▲† Massman Constr. Co., 20 W. 9 St., Kansas City, Mo., and S. Patti Constr. Co., 1340 Admiral St., Kansas City, Mo., Contract Awarded, $3,500,000, rehabilitation Sunflower Ordnance Works, SUNFLOWER, KAN., U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., Hercules Powder Co., Delaware Trust Bldg., Wilmington, Del., will operate. Tanner & Mitchell, 310 Ward Pkwy., Kansas City, Mo., engr.-archts.

Brusca Bros., Inc., 229 Yardley Way, Pittsburgh, Pa., Contract Awarded, $781,000, est. $962,085, 24 two story brick houses, AMBRIDGE, PA., Beaver County Housing Auth., Beaver. Bids Dec. 15. CD 1/4, under LB.

▲ Gottlieb Schneider, 1434 Monocacy St., Bethlehem, Pa., Contract Awarded, $3,980,077, 400 units Marine Village Proj. BETHLEHEM, PA., Bethlehem Housing Auth., Bethlehem. Lovelace & Spillman, 103 W. Broad St., archts.

▲† Tennessee Valley Authority, New Sprankle Bldg., Knoxville, Tenn., Own forces, Approx. $85,000,000, Swan's Pond Steam Plant, 2 mi. from KINGSTON, TENN.

† Patti MacDonald Constr. Co., 1340 Admiral Blvd., Kansas City, Mo., Contract Awarded, $959,800, est. $917,118, bachelor officers' and civilian bachelors' quarters Inv. No. 51-32, FORT RICHARDSON, ALASKA, U. S. Eng. (APO 942, c/o PM, Seattle, Wash.) Anchorage. Bids Dec. 13. CD 12/20, under LB.

▲† Patti MacDonald Constr. Co., 1340 Admiral Blvd., Kansas City, Mo., Contract Awarded, $5,089,542, est. $5,167,119, 35 eight-family quarters bldgs., Inv. No. 51-31, FORT RICHARDSON, ALASKA, U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage. Bids Dec. 14. CD 12/20, under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

Ill., Chicago—DAY SCHOOL—B.A. 1/25—Associated Talmud Toras of Chicago, 524 W. Melrose St., 2 story, 33,000 sq. ft. brick, concrete day school, $300,000. Loewenberg & Loewenberg, 111 W. Monroe St., Chicago, Zone 3, archts. CD 9/11.

Wis., Durand—HOSPITAL ADDN.—B.A. 2/1—Sisters of the Order of St. Benedict, Eau Claire, hospital addn., $414,930. Plans deposit $20. Durrant & Berquist, Boscobel, Wis., archts. CD 12/11/47.

Wis., Madison—RESIDENT DORMITORY—B.A. 2/13—Wisconsin University Bldg. Corp., Madison, 5 story, bsmnt., 35x161 ft., concrete, steel, brick intern resident dormitory. Plans deposit $25. R. C. Kirchof, Madison, state archt.

LOW BIDDERS

Dr. Leonard Booke, c/o Edward Grew Halstead, archt., 840 N. Michigan Ave., Chicago 11, Ill., project abandoned, three 3 story 42-unit apartments bldgs., $300,000. CICERO, ILL. CD 12/26.

Jordan Constr. Co., P. O. Box 973, Jackson, Miss., Low Bidder, $350,000, Y.W.C.A. bldg., JACKSON, MISS., Y.W.C.A., 117 N. West St., Jackson, Miss. Bids Jan. 5. CD 1/3.

Estate of Rogers Lacy, 2618 Cedar Springs St., Dallas, Tex., rejected bids Dec. 19, 20 story bsmnt., stores and office, DALLAS, TEX. CD 1/9 under LB.

CONTRACTS AWARDED

Jacob Horn & O. F. Steinan, 10248 S. Paramount Blvd., Downey, Calif., Contract Awarded, $785,100, 103 frame, stucco dwellings at Studebaker Rd. and Fairfield Ave., NORWALK, CALIF., Southern Land Co., 10248 S. Paramount Blvd., Downey.

Turner Constr. Co., 1500 Walnut St., Phila., Pa., Contract Awarded, $500,000, office, WILMINGTON, DEL., Beneficial Industrial Loan Corp., 13 and Market Sts., Wilmington. CD 12/12.

▲ George D. Auchter Co., foot of E. 56 St., Jacksonville, Fla., Contract awarded $1,000,000, 6 story, steel, concrete, tile home office, on River front between Rosselle and Gillmore Sts., JACKSONVILLE, FLA., Peninsular Life Insurance Co., Forsythe and Julia Sts., Zone 1. Kemp, Bunch & Jackson, Florida Theatre Bldg., Jacksonville, Zone 1, archts., Awarded Jan. 5.

Leonard Glickman, 169 N. W. 20 St., Miami, Fla., Contract Awarded, $400,000, apartment development, MIAMI, FLA. Bigdan Corp. c/o contractor.

Mion Constr. Co., Techwood Dr. N. W., Atlanta, Ga., Contract Awarded, $400,000, Y.W.C.A. Bldg., ATLANTA, GA. Y.W.C.A., 37 Auburn Ave. N. E., Atlanta. CD 2/5/47.

Samuel Constr. Co., 77 W. Washington St., Chicago, 2, Ill., Contract Awarded, $900,000, 12 story 96 unit apartment at 5485 S. Everett, Zone 15, CHICAGO, ILL., David H. Caplow, 100 N. LaSalle St., Chicago, Zone 2, Charles Wheeler Nicol, 105 W. Madison St., Chicago, Zone 3, archts. Awarded Dec. 29.

J. W. Snyder & Co., 307 N. Michigan Ave., Chicago, 1, Ill., Contract Awarded, $300,000, 2 story, bsmnt., brick, concrete orthogenic institute, CHICAGO, ILL., University of Chicago, 1365 E. 60 St., Chicago, Zone 9. Bids Nov. 14, awarded Jan. 2. CD 11/10.

▲ Theodore Loranger & Sons, 404 Nash Rd., New Bedford, Mass., Contract Awarded, $1,328,038 Hospital addn. and alterations, Page, Allen, West and Taber Sts., NEW BEDFORD, MASS., St. Luke's Hospital, 101 Page St., New Bedford, Mass. Bids Nov. 30. CD 11/9.

Brittany Homes, Inc., 126545 E. 7 Mile Rd., Detroit, Mich., Owner Builds, $450,000, 48 housing units, University St., DETROIT, MICH.

Elway Realty Co., 126545 E. 7 Mile Rd., Detroit, Mich., Owner Builds, $350,000, 36 single frame houses, 10 Mile Rd. section, FERNDALE, MICH.

Francis J. Corr, Inc., 1120 Sheridan St., Lansing, Mich., Contract Awarded, $475,000, 1 and 2 story, bsmnt., brick, concrete, stone Church of the Resurrection and School, Custer and Michigan Aves., LANSING, MICH., St. Theresa R. C. Parish, Michigan Ave., Lansing, Mich.

J. A. Fredman, Pontiac, Mich., Contract Awarded, $300,000, 1 story, bsmnt., brick, stone church, PONTIAC, MICH., Grace Lutheran Parish, Pontiac, Mich. Bids Dec. 5. CD 11/27.

▲ E. H. Marhoefer, Jr., 505 N. LaSalle St., Chicago 10, Ill., (sponsor) construct, manage, finance, Contract Awarded $5,000,000, row housing, SELFRIDGE AIR BASE, MICH., Dpt. of Air Force, The Pentagon, Wash., 25, D. C., Lankton & Ziegele, 110 Main St., Peoria, Ill., archts.

G. E. Bass & Co., 210 Woodrow Wilson Ave., Jackson, Miss., Contract Awarded, $350,000, shopping center at Capitol and Monument Sts., JACKSON, MISS., Edmel of Mississippi, Inc., c/o contractor.

▲ Robert Paulus Constr. Co., 3441 Morganford Rd., St. Louis 16, Mo., Contract Awarded, $1,539,556, 9 story, bsmnt., 42x238 ft. and 58x60 ft., brick, rein. con., T-shaped nursing school, ST. LOUIS, MO., DePaul Hospital, Sisters of Charity, Sister Audrea, pres., 2415 N. Kingshighway, St. Louis 13, Mo. CD 12/15 under LB.

▲ Dillon Constr. Co., 3420 Jones St., Omaha, Neb., Owner builds, $3,500,000, 100 high priced dwellings in new addn. at 66 and Underwood Sts. OMAHA, NEB., J. C. Jackson, 513 S. 20 St., Omaha, engr. and archt.

▲ Adolph Shock, Palisade, N. J., Owner builds, $1,024,000, 131 unit rental housing project at Joralemon St. and Celia Terrace, BELLEVILLE, N. J., Erwin Gerber, 1180 Raymond Blvd., Newark, archt.

▲ Vermilya Brown Co. Inc., 100 E. 42 St., New York, Zone 17, Contract Awarded, $1,250,000, 3 dormitories and gymnasium, PLEASANT PLAINS, N. Y., Mission of the Immaculate Virgin, 381 Lafayette St., New York, Zone 12. Bids Nov. 28. CD 11/16.

George A. Creed & Son, 1618 Sumter St., Columbia, S. C., Contract Awarded, $500,000, 84 apartment units, HICKORY, N. C., Homer A. McNeeley, A. Creed & J. L. Friday, c/o contractor.

▲ Landy L. Evanson & Sons, Holland & Engel Rds., Brook Park Village, Owner builds, Approx. $1,000,000, 64 home project, BROOK PARK VILLAGE, O.

20th Century Builders, Inc., 55 E. State St., Columbus, O., Owner builds, Est. $800,000, 109 frame houses on Woodland, Brentnell Aves., Sagamore Rd., Marston Rd. and Delavan Dr., in Mifflin Twp. COLUMBUS, O.

▲ Standard Constr. Co., 1010 Vermont Ave. N. W. Wash. D. C., Contract Awarded, $5,000,000, 10 story brick and concrete apartment, LAKEWOOD, O., Estate of James A. Garfield, A. H. Beckwith, Leader Bldg., Cleveland, Weinberg & Teare, Citizens Bldg., Cleveland, Zone 14, archts.

▲ Margo Constr. Co., 4248 N. Broad St., Phila., Separate Contracts, Approx. $3,150,000, residential development, BRISTOL, PA.

Mar-Ann Holding Co., Lansdowne, Separate Contracts, Approx. $500,000, residential development, Sproul Rd. BROOMALL, PA.

Culhane Constr. Co., Edgewood Hills, Wilmington, Del., Separate contracts, $900,000, residential development, Bryn Mawr Ave., BRYN MAWR, PA.

Denmax Homes, Inc., 20 S. 15 St., Phila., Separate Contracts, Approx. $612,000, residential development, Tyson St., PHILA. PA. Christian H. Fries, 3701 N. Broad St., Phila. archt.

Powell Elkins Corp., 8020 York Rd., Phila., Pa., Separate Contracts, Approx. $500,000, residential development, Provident and Michener Sts. PHILA. PA. L. J. Cowan, 1505 Pine St., archt.

Yarbrough Const. Co., Box 851, Austin, Tex., Contract Awarded, $509,320, est. $500,000, 2 story state medical headquarters and library, AUSTIN, TEX. State Medical Assoc. of Texas, Medical Bldg., Austin. Bids Dec. 23. Awarded Jan. 3. CD 1/4 under LB.

▲ Standard Constr. Co. Inc., 1010 Vermont Ave. N. W. Wash., D. C., Contract Awarded, Approx. $2,000,000, L-shaped, brick shopping center containing 25 stores, Falls Church Medical Center and 500 cars parking lot, north side of Lee Blvd., between Patrick Henry and Willston Drives, ¼ mi. east of Falls Church Traffic Circle, FALLS CHURCH, VA. Willston Commercial Center, c/o M. Seth Horne, co-owner, Cafritz Bldg., Wash. 6, D. C. Corning & Moore, 1726 M St. N. W. Wash., D. C., archts. Awarded Jan. 4.

Lowell Constr. Co., 12510 15 Ave. N. E., Seattle, Wash., day labor, $305,000, 42 houses in area north of city on W. 185, 196 Sts. Meridian and Dayton Aves., 1, 4 and 11 Aves. N. W., E. 171, 91, 169, 130, 123, 155 and 88 Sts., 27, 25, 47, and 3 Aves. N. E., SEATTLE, WASH. CD 1/8.

Tietz Constr. Co., Lakewood, Tacoma, Wash., day labor, $500,000, 41 houses east of Clover Park, TACOMA, WASH. CD 1/5.

▲ W. C. Wells Constr. Co. Ltd., 10571 115 St., Edmonton, Alta. Contract Awarded. Approx. $1,000,000. Main branch bank, EDMONTON, ALTA. Imperial Bank of Canada, King & Bay Sts., Toronto. Bids Dec. 19, awarded Jan. 6. CD 12/8.

INDUSTRIAL BUILDINGS

SOON LETS CONTRACT

Tex., Houston—FACTORY— Garson & Kaplan, Karbro Garment Mfg. Co., 2500 Washington Ave., soon lets contract garment factory. $350,000. Plans deposit $25. Gabert & Wisdom, 1315 Bell St., archts., W. P. Moore, 4605 Montrose Blvd., engr. CD 12/18.

LOW BIDDERS

Stiner Constr. Co., 217 E. Burnet, Louisville, Ky., Low Bidder $300,000, 100,000 sq. ft. WAREHOUSE, and PARKING AREA, NEW ALBANY, IND. Gunnison Homes, Charlestown Rd., New Albany CD 12/4, under CA. (Correction- contractor)

Herman Weber, 800 N. Pearl St., Beaumont, Tex., Low Bidder $241,000, est. $200,000, warehouse and shop, BEAUMONT, TEX. United Gas Corp., 200 Pearl St. Bids Dec. 21. CD 12/19.

CONTRACTS AWARDED

Griffith Co., 1060 S. Broadway, Los Angeles, Calif., Contract Awarded. $175,000, steel STORAGE SHED, VERNON, CALIF. Duccomun Metals & Supply Co., 4890 S. Alameda St. CD 1/8.

▲ **E. I. du Pont de Nemours & Co., Inc.,** du Pont Bldg., Wilmington, Del., own forces, $2,700,000, four 1 story brick buildings, 1 for service and 3 for nutrition, biology and animal disease research, to be called STINE LABORATORY, Oakland, near here, NEWARK, DEL.

Rust Eng. Co., Exchange Bldg., Birmingham, Ala., Contract Awarded Approx. $500,000, design and construction FERTILIZER MFG. PLANT ADDN., BARTOW, FLA. Armour Fertilizer Works, Hurt Bldg., Atlanta, Ga.

▲ **Pasco Packing Co.,** Dade City, Fla., Owner builds, $3,000,000 PLANT EXPANSION, DADE CITY, FLA. Awarded Jan. 2.

T. M. Mimms, c/o owner, Contract Awarded, Approx. $100,000, furniture mfg. PLANT, ATLANTA, GA. Artcraft Furniture Mfg. Co., Foster St., N. W., Atlanta.

Carroll Constr. Co., 333 N. Michigan Ave., Chicago, 1, Ill., Contract Awarded, $150,000, SUBSTATION at 6033 N. Pulaski St., Zone 5, CHICAGO, ILL. Commonwealth Edison Co., 72 W. Adams St., Chicago Zone 3, Bids Dec. 12, awarded Dec. 29. CD 12/4.

Poirot Constr. Co., 2001 W. Pershing St., Chicago, 9, Ill., Contract Awarded, $500,000, 3 story WAREHOUSE ADDN. in Central Mfg. District, CHICAGO, ILL. United Drug Co., 2305 W. Pershing St., Zone 9. A. Epstein & Sons Co., 2011 W. Pershing St., Chicago, Zone 9, archt.

Allen Parker, 271 E. 159 St., Harvey, Ill., Contract Awarded, $400,000, 50,000 sq. ft. FACTORY, CRETE, ILL. Mail Tool Co., 7740 S. South Chicago Ave., Zone 19. Awarded Jan. 2.

H. K. Ferguson Co., 120 S. LaSalle St., Chicago, 3 Ill. Contract Awarded, $400,000, 1 story part bsmnt., 35,000 sq. ft. research LABORATORY, SKOKIE, ILL. International Minerals & Chemical Co., 20 N. Wacker Dr., Chicago, Zone 6. Awarded 1/3. CD 12/29.

Rust Engineering Co., 525 6 Ave., Pittsburgh, Pa., Contract Awarded, $100,000, design and constr. SALT PLANT, WEEKS, LA. Bay Chemical Co., div. Morton Salt Co., 1048 Constance St., New Orleans, Zone 9, La.

Piracci Constr. Co., Inc., 2552 Woodbrook Ave., Baltimore, Md. Contract Awarded, $125,000, 64x165 ft. rein.-con. open deck PARKING GARAGE; 10-14 S. Hanover St., BALTIMORE, MD. Baltimore Garage, Inc., 10-14 S. Hanover St., Baltimore, Md., Harry L. Katz, 3212 Gwynns Falls Parkway, Baltimore, Md., engr.

Ernest F. Carlson, Inc., 1649 Main St., Springfield, Mass. Contract Awarded, $750,000, design and constr. WAREHOUSE and mfg. bldg., EASTHAMPTON, MASS., Stanley Home Products, Inc., 42 Arnold St., Westfield, Mass.

Production Steel Co., 20001 Sherwood Ave., Detroit, Mich. Owner Builds, $101,000, steel, 14,000 sq. ft. masonry warehouse addn., Sherwood Ave., DETROIT Mich.

Kraus-Anderson, Inc., 501 8 St. S., Minneapolis, Minn. Contract Awarded, $788,000, parking GARAGE at 9 St. and LaSalle Ave., MINNEAPOLIS, MINN., Downtown Auto Park, Inc., L. Wakefield Jr., 503 Syndicate Bldg., Minneapolis, Minn. Bids Dec. 28. CD 12/20.

Madsen Constr. Co., 2110 Nicollet Ave., Minneapolis, Minn., Contract Awarded, $150,000, 1 story, 104x241 ft., warehouse and office at 20 Lakeside Ave., MINNEAPOLIS, MINN., Nolaco, c/o contractor.

Minneapolis Gas Co., 739 Marquette Ave., Minneapolis, Minn. Owner builds, $400,000, concrete block WAREHOUSE and GARAGE at 501 W. 61 St., MINNEAPOLIS, MINN.

E. A. Brunson Constr. Co., 4052 Forest Park Blvd., St. Louis 8, Mo. Contract Awarded. 1 story, 61x101 ft., brick, concrete WAREHOUSE and office, 1200 S. Grand Blvd., ST. LOUIS, MO., L. C. Glass, 3849 Holly Hills, St. Louis 16, Mo., Steffen Widman & Co., 3453 Nebraska Ave., St. Louis 18, Mo., archts.

Chadakoin Constr. Corp., 335 E. 3 St., Jamestown, N. Y., Contract Awarded. Approx. $150,000. 1 story bsmnt., brick, concrete HIDE HOUSE for tannery. GOWANDA, N. Y. Brown Shoe Co., 1600 Washington Ave., St. Louis 3, Mo. Herbert Patton, c/o owner, Ch. engr.

English Const. Co., Altavista, Va., Contract Awarded. Approx. $200,000. MILL adn. GREENSBORO, N. C. Cone Mills Corp., c/o contractor.

Steinle-Wolfe, Inc., 128 N. Jefferson St., Fremont, O., Contract Awarded, 10,000 sq. ft. FACTORY, FREMONT, O. Fremont Tool & Die Co., Fremont, Awarded Jan. 3.

H. K. Ferguson Co., 1783 E. 11 St., Cleveland, O. Contract awarded, rehabilitate FACTORY for production of magnesium PAINESVILLE, O. Diamond Magnesium Co., Painesville. CD 4/25.

RUST ENGR. CO. Exchange Bldg., Birmingham, Ala., design and construct, Contract Awarded. Approx. $650,000. 100,000 sq. ft. WAREHOUSE for storage food products NASHVILLE, TENN. Kroger Co., 700 19 Ave. N.

John Carson, Landers Bldg., Springfield, Mo., Contract Awarded. Approx. $900,000-$1,000,000. 2 story brick, open steel frame distributing WAREHOUSE for shoes. TRENTON, TENN. Brown Shoe Co., 1600 Washington Ave., St. Louis 3, Mo. Herbert Patton, c/o owner, ch. engr.

Farnsworth & Chambers, Inc., Box 74, Houston, Tex., Contract Awarded, $186,245, est. $150,000 3 story brick and terra cotta exterior, PRINTING PLANT addn. rein.-con. piers, grade beams, columns and drilled footings fdn. BEAUMONT, TEX. Beaumont Enterprise & Journal Publishing Co., 380 Walnut St. Beumont. Bids Jan. 4. CD 12/11.

George Levitan, 2000 White Settlement Rd., Fort Worth, Tex. Own forces. Approx. $90,000. 20,000 sq. ft. WAREHOUSE. FORT WORTH, TEX. CD 1/8.

T. D. Howe Constr. Co., 3211 White Oak St., Houston, Tex. Contract Awarded. $88,100. PLANT remodeling and repairing, HOUSTON, TEX. Charles W. Duncan, 3704 Navigation Blvd.

E. H. Conrad, 150 Simpson St., San Antonio, Tex. Contract Awarded, $295,000. 40,000 sq. ft. WAREHOUSE, SAN ANTONIO, TEX. Strauder G. Nelson, N. Medina St. CD 1/8.

George Kotze, 4219 W. National Ave., Milwaukee, Zone 15, Wis., Contract Awarded, $90,000 1 story 60x135 ft., concrete, steel, concrete block FACTORY, MILWAUKEE, WIS. Artos Eng. Co., 2737 S. 28 St., Zone 15. J. Topzant, 424 E. Wells St., Zone 2, archt.

UNCLASSIFIED

BIDS ASKED

Calif., Fresno—SWIMMING POOLS—B.A. 1/23—Bd. Educ., 2348 Mariposa St., Fresno, constr. swimming pools at Roosevelt, Edison and Fresno High Schools. CD 1/22/47.

South Carolina—RURAL DISTRIBUTION LINES—B.A. 1/23—South Carolina Public Service Auth., Moncks Corner, 33 kv rural distr. line, 13.9 mi. single circuit from point north of Murrell's inlet to vicinity of Pawley's Island, Horry Co. Plans deposit $10. CD 2/13/45.

Texas—RURAL DISTRIBUTION LINES—B.A. 1/23—Grayson-Collin County Electric Co-operative, Inc., Van Alstyne, 88.8 mi. rural distr. lines, incl. 78 mi. conversion. Grayson and Collin Counties. $75,000. Plans deposit $10. Joe E. Ward, 545 Nacol Bldg., Wichita Falls, engr. CD 9/11/46.

CONTRACTS AWARDED

Michigan Bell Telephone Co., 1365 Cass Ave., Detroit, Mich., Owner Builds. $800,000, cable lines connecting twp., penninsulas, Petoskey to Mackinaw City, Petoskey to Grand Rapids, Petoskey to Trout Lake at Houghton, new lines to connect Escanaba, Newberry, Marquetta, Sault Ste Marie and Houghton, MICHIGAN.

▲† **Orlando Constr. Co.,** Coleman, Wis. Contract Awarded, $427,826 mi. transmission lines Sioux Falls to Brookings; $509,260, 68 mi. from Armour to a point near the site of the switchyard at Fort Randall and from thence to Gavins Point***Flora Constr. Corp. and Flora Engr. Co., 1717 E. Colfax Ave., Denver, Colo., $1,338,304, 84 mi. of line from Huron to Armour and 89 mi. from Gavins Point to Sioux Falls. Spec. DC-3243. Bids Dec. 19. CD 12/28, under LB.

C. F. Lytle Co., Box 206, Sioux City, Ia. and **R. N. Campsey, Constr. Co.,** 2520 Leydon St., Denver, Colo. and the **B and C Constr. Co.,** 1317 Arborvitae St., Dallas, Tex., Contract Awarded, $1,865,307, 53 mi. 115 kilovolt transmission lines from Brookings to Watertown; 77 mi. from Watertown to Groton and 90 mi. from Groton to Huron, Spec. No. DC-3246. Bids Dec. 21. Grand total $4,140,697. SOUTH DAKOTA. Bureau Reclamation, Dpt. Interior, Huron.

▲ **Fulton & Brodie,** Beeville, Tex. Contract Awarded, $9,860,000. 284 mi. 20 in. natural gas pipe line between near Wharton to McAllen, TEXAS. Trunk Line Gas Co., Edge.

OFFICIAL PROPOSALS

Bids: February 14, 1951 (254)

Sewage Treatment Works

CITY OF EASTON AUTHORITY BOARD
EASTON, PENNSYLVANIA

Sealed proposals for the construction of a complete sewage treatment plant will be received by the City of Easton Authority Boardat until 10:00 A.M., February 14, 1951, at which time the bids will be publicly opened and immediately read in a meeting of the Authority to be held in the City Hall, Easton, Pennsylvania.

The plant will include the construction of a detritor, control building, primary and secondary clarifiers, high rate filters, separate sludge digestion tanks, chlorine contact tank, plumbing, heating and electrical work and installation of new pumps in an existing pumping station.

Specifications, Proposal Forms, Drawings and other contract documents may be examined at the office of the City Engineer, Easton, Pennsylvania or at the office of Ivan M. Glace, Consulting Engineer, Harrisburg, Pennsylvania. A complete set of bidding documents may be obtained at either office upon depositing $25.00. This full amount will be refunded if a bid is submitted and if the documents are returned in good condition within ten days after the opening of bids. If documents are not returned within this period, the deposit will be forfeited. No deposit will be returned to non-bidders.

No bid on the construction work will be considered unless it is accompanied by the bidder's certified check made payable to the City of Easton Authority Board for the sum of $25,000. This sum will serve as bid security and will be forfeited to the Authority as liquidated damages in the event an award is made and the contracts and bonds are not promptly and properly executed as required in the specifications.

No bidder may withdraw his bid within 35 days after the actual date of opening.

The City of Easton Authority Board reserves the right to reject any or all bids, to waive any technical defects, and to accept any bid that it may deem to be for the best interests of the Authority.

BY ORDER OF THE CITY OF
EASTON AUTHORITY BOARD.

Bids: January 30, 1951 (259)

Clearing and Grubbing Rondout Reservoir

CONTRACT 398

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A. M., Eastern Standard Time, on Tuesday, January 30, 1951, for Contract 398, for clearing approximately 1,050 acres between Elevation 760 and an established clearing line and for grubbing approximately 275 acres between Elevation 825 and the clearing line, in the upper portion of the Rondout reservoir in preparation for the storage of water, all as set forth in the specifications. The Rondout reservoir is located in the Towns of Wawarsing, Ulster county, and Neversink, Sullivan county, New York.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of fifteen thousand dollars ($15,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained at the office of the Chief Engineer, Room 1311 at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, JAMES J. MORAN, Commissioners, Board of Water Supply: RICHARD H. BURKE, Secretary.

(Continued on page 88)

OFFICIAL PROPOSALS

RATE: THE RATE FOR OFFICIAL PROPOSAL ADVERTISING IS $1.00 PER LINE (OR FRACTION) PER INSERTION.

COPY RECEIVED UP TO 3:00 P. M. FRIDAY FOR ISSUE OUT FOLLOWING THURSDAY SUBJECT TO SPACE OPEN FOR LAST MINUTE ADS

SEND COPY TO OFFICIAL PROPOSAL DIVISION, ENGINEERING NEWS-RECORD, 330 W. 42ND ST., NEW YORK 18, N. Y.

(Continued from page 87)

Bids: January 23, 1950 (272)

Installation of Chairs & Bleacher Seats

MILWAUKEE COUNTY PARK COMMISSION
Room 303 Court House

Sealed bids will be received at this office until 11:00 a.m., Tuesday, January 23, 1951 for furnishing material, equipment, tools, seating plans and performing all labor necessary for the installation of:

Item 1—15,000 Riser type stadium chairs
2—3,800 Steel folding chairs
3—7,800 wood bleacher seats with riser type attachment

Each item shall be bid individually on a per seat basis.

Specifications will be available at the Milwaukee County Regional Planning Department, Room 303, Court House, after Tuesday, January 9, 1951.

MILWAUKEE COUNTY PARK COMMISSION
Jerome C. Dretzka,
Executive Secretary

Bids: Jan. 30, 1951 (268)

Plumbing Systems

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 A.M. (Eastern Standard Time), the 30th day of January 1951, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contract and or contracts.

For the construction of Plumbing Systems for the following three (3) Maintenance Buildings on the Pennsylvania Turnpike as follows:

Contract No.	Maintenance Building No	Station	County
334 A	4	240+50	Westmoreland
335 A	2	586+50	Allegheny
336 A	3	207+50	Beaver

The work to be performed under this contract is generally in and around the Maintenance Building above-mentioned and enumerated. The work does not include the Electrical Systems, the Heating Systems nor building construction except as noted in the specifications or as shown on the Contract Drawings.

Copies of plans and specifications and other contract documents, including Reference Drawings, will be on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania on 12 January 1951. Plans and contract documents will not be available before this date for inspection or for mailing to prospective bidders.

Plans and specifications may be obtained from the Commission upon deposit of ten ($10.00) dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and specifications returned if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for contract drawings and specifications.

The Pennsylvania Turnpike Commission reserves the right to award each contract as a separate contract or as a combined contract.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
8 January 1951

Bids: February 8, 1951 (265)

General Construction Setauket School

Sealed bids will be received by the Board of Education, Union Free School District Number 2, Town of Brookhaven, East Setauket, Suffolk County, New York, at The Setauket High School Office until 2 p.m. on Thursday, February 8, 1951, for all labor and material necessary for the construction of a K-9 school building to be located on the southwest side of North Country Road between the Emma S. Clark Memorial Library Association and the St. James Roman Catholic Church in Setauket, according to plans and specifications prepared by the architect of the Board, Mr. Richard Haviland Smythe, 1 East 53 St., New York 22, and on file in the office of the school and in the office of F. W. Dodge Corporation, 119 West 40 St., New York 18. Copies of said plans and specifications may be obtained from the school on and after Monday, January 15, 1951, on deposit of a fee, which deposit will be returned upon the return of the plans and specifications in good order.

Separate proposals will be received on the work as a whole, on the general contract exclusive of mechanical trades and equipment, or upon the following items or any combination of them: Heating and Ventilating, Plumbing, Electrical Work.

All proposals shall be made in conformity to law, on the letterhead of the contractor, and shall be enclosed in a sealed envelope addressed to the Board of Education, Union Free School District Number 2, East Setauket, L. I., N. Y., "Proposal for General Contract (or other specific items) for the Construction of a School Building in Setauket" on the outside of the envelope.

Each bid shall be accompanied by a bond with surety or sureties satisfactory to the Board of Education, which surety or sureties shall be in an amount equal to or greater than five (5%) per cent of the amount of the bid, or by cash or certified check drawn on a solvent bank or trust company in an amount equal to or greater than five per cent (5%) of the amount of the bid. Surety shall be given or checks shall be drawn in favor of the Treasurer of the Board of Education. Sureties will be forfeited if the bidder refuses or fails to enter into a contract with the Board and to furnish the required construction bond within ten days after notice of acceptance of proposal. Sureties of the unsuccessful bidders will be returned and the surety of the successful bidder will be returned upon execution of the contract and furnishing a bond as a guarantee of the faithful performance of the work.

The Board of Education reserves the right to waive any informalities in or to reject any, or any part of any or all bids.

Frederick Hilliard, Clerk
Union Free School District #2
East Setauket, N. Y.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3282) will be received by Bureau of Reclamation, Columbia Falls, Montana, February 20, 1951, and then publicly opened for furnishing labor and materials and performing all work for the completion of Hungry Horse Dam, Power Plant, and Switchyard, Hungry Horse Project, Montana. The work is situated about 9 miles southeast of Columbia Falls, Montana. Principal items are approximately: (a) Schedule No. 1, 4,500 sq. yds. of colored bonded concrete floor finish; installing 285,000 lbs. of cable trays, handrailing, gratings, cover plates, and platforms; installing and testing four 105,000-hp hydraulic turbines; installing and testing four 200,000-ft.-lb. governors; furnishing and installing 204,000 lbs. of piping; installing 270,000 lin. ft. of electrical conductor; and installing 1,478,000 lbs. of power transformers; (b) Schedule No. 2, 180 cu. yds. of concrete; erecting 113,000 lbs. of steel structures; furnishing and constructing service building; furnishing and installing 33,000 lin. ft. of electrical conduit; and installing 60,000 lin. ft. of electrical conductor; and other work. Time allowed for completion varies for different parts of the work but all work for Schedule No. 1 must be completed in 1,100 days, and all work for Schedule No. 2 must be completed in 415 days. For particulars, address Bureau of Reclamation, Hungry Horse Government Camp, Columbia Falls, Montana; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(274)

Department of Commerce, Bureau of Public Roads, January 9, 1951. SEALED BIDS will be received at the office of the Division Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., E.S.T., FEBRUARY 9, 1951, for Project 1F3, Baltimore-Washington Parkway, Prince Georges County, Maryland. Two Reinforced Concrete Bridges over Laurel-Bowie Road. The approximate quantities of the more important items are as follows: 34,000 cu. yd. Excavation, 4,080 cu. yd. Cement Concrete, 580,000 lb. Reinforcing Steel and 30,000 lin. ft. Treated Timber Piling. Minimum wage rates have been fixed as required by law. For plans and specifications, a deposit of $10.00 cash or CERTIFIED check made payable to the Treasurer of the United States, will be required to insure their return within 15 days after the opening of bids. Plans, specifications, and proposal form may be obtained at the address given above, H. J. Spelman, Division Engineer.
(277)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3279) will be received by Bureau of Reclamation, Denver, Colorado, Feburary 15, 1951, and then publicly opened for furnishing and installing one 35,000-kva, 90-percent power factor, 514-rpm, 13,800-volt, vertical-shaft, alternating-current generator (second unit) for the Flatiron Power Plant, Colorado-Big Thompson Project, Colorado. Installation is desired within 800 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(276)

(Continued on page 89)

U. S. Government
(Continued from page 88)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3278) will be received by Bureau of Reclamation, Superior, Nebraska, February 6, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of earthwork and structures for Superior lateral system, laterals 5.7 to 29.3, sublaterals, drains, and miscellaneous changes, Superior-Courtland Unit, Bostwick Division, Nebraska-Kansas, Missouri River Basin Project. The work is situated near Superior, Nebraska. Principal items are approximately: excavation 188,000 cu. yds.; concrete 950 cu. yds.; concrete pipe 8,800 lin. ft., gates and miscellaneous metalwork 22,000 pounds; and other work. Time allowed for completion will be 300 days. For particulars, address Bureau of Reclamation, Superior, Nebraska; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(G271)

OFFICIAL PROPOSALS

Bids: January 30, 1951 (269)

Maintenance Building

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission for the the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania until 10:00 A.M. (Eastern Standard Time), the 30th day of January 1951 and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania and publicly opened and read aloud for the following contract and/or contracts.

For the construction of the Maintenance Building at the location listed below:

Contract No.	Maintenance Building No.	Station	County
335	2	586+50	Allegheny
336	3	207+50	Beaver

The work to be performed under this contract consists of the construction of the Maintenance Building, paved areas, road, concrete sidewalks, etc., at points on the Turnpike listed above, not including, however, the plumbing, the heating systems, the electrical work, or the seeding and sodding; except as noted on the specifications or as shown on the Contract Drawings.

Copies of plans, specifications, and other contract documents, will be on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania on 12 January 1951. Plans, specifications and other contract documents will not be available before this date for inspection or for mailing to prospective bidders. Copies of specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Comission for the sum of five ($5.00) dollars per copy.

Plans and specifications may be obtained from the Commission upon deposit of ten ($10.00) dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and specifications returned if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for contract drawings and specifications.

The Pennsylvania Turnpike Commission reserves the right to award each contract as a separate contract or as a combined contract.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
January 8, 1951

Note: Maintenance Building Number 1, now under construction, is not included in this work.

OFFICIAL PROPOSALS

Bids: January 30, 1951 (264)

State Highway Work

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

PALISADES INTERSTATE PARKWAY, SECTION 1E

Construction of Palisades Interstate Parkway, Section 1E, from Station 256+90 South of Hudson Avenue to a point 2,800 feet South of Hillside Avenue, Grading, Boroughs of Tenafly and Alpine, Bergen County. Length 1.196 miles.

Estimated:
13,900 cu. yds. Roadway Excavation—Earth
65,500 cu. yds. Roadway Excavation—Rock
68,800 cu. yds. Borrow Excavation

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, January 30, 1951, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special dressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: Jan. 30, 1951 (267)

Electrical Systems

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania until 10:00 A.M. (Eastern Standard Time), the 30th day of January 1951 and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania and publicly opened and read aloud for the following contract and/or contracts.

For the construction of Electrical Systems for the following three (3) Maintenance Buildings on the Pennsylvania Turnpike as follows:

Contract No.	Maintenance Building No.	Station	County
334-C	1	240+50	Westmoreland
335-C	2	586+50	Allegheny
336-C	3	207+50	Beaver

The work to be performed under this contract is generally in and around the Maintenance Building above-mentioned and enumerated. The work does not include the Plumbing Systems, the Heating Systems nor building construction except as noted in the specifications or as shown on the Contract Drawings.

Copies of plans and specifications and other contract documents, including Reference Drawings, will be on file and open to public inspection at the Offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania on 12 January 1951. Plans and contract documents will not be available before this date for inspection or for mailing to prospective bidders.

Plans and specifications may be obtained from the Commission upon deposit of ten ($10.00) dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and specifications returned if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for contract drawings and specifications.

The Pennsylvania Turnpike Commission reserves the right to award each contract as a separate contract or as a combined contract.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
8 January 1951

OFFICIAL PROPOSALS

ary 1951. Plans and contract documents will not be available before this date for inspection or for mailing to prospective bidders.

Plans and specifications may be obtained from the Commission upon deposit of ten ($10.00) dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and specifications returned if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for contract drawings and specifications.

The Pennsylvania Turnpike Commission reserves the right to award each contract as a separate contract or as a combined contract.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
8 January 1951

Bids: Jan. 30, 1951 (266)

Heating Systems

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 A.M. (Eastern Standard Time), the 30th day of January 1951, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contract and/or contracts:

For the construction of Heating Systems for the following three (3) Maintenance Buildings on the Pennsylvania Turnpike as follows:

Contract No.	Maintenance Building No.	Station	County
334-B	1	240+50	Westmoreland
335-B	2	586+50	Allegheny
336-B	3	207+50	Beaver

The work to be performed under this contract is generally in and around the Maintenance Building above-mentioned and enumerated. The work does not include the Electrical Systems, the Plumbing Systems nor building construction except as noted in the specifications or as shown on the Contract Drawings.

Copies of plans and specifications and other contract documents, including Reference Drawings, will be on file and open to public inspection at the Offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania on 12 January 1951. Plans and contract documents will not be available before this date for inspection or for mailing to prospective bidders.

Plans and specifications may be obtained from the Commission upon deposit of ten ($10.00) dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans and specifications returned if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for contract drawings and specifications.

The Pennsylvania Turnpike Commission reserves the right to award each contract as a separate contract or as a combined contract.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
8 January 1951

(Continued on page 90)

OFFICIAL PROPOSALS
(Continued from page 89)

Bids: January 25, 1951 (275)

State Road Work

Sealed bids will be received at the Department of Highways, Room 400, Central Highway Office Building, 1221 E. Broad Street, Richmond, Virginia, until 10:00 A.M., Thursday, January 25, 1951, for the following:

Route	Project	County	Description
1 & 301	1620-02	Chesterfield	0.83 Mi. 2-Lane 20' x 8" Bit. Conc. Pave. 0.46 Mi. N. of Walthall Underpass (A. C. L.) 0.37 Mi. S. of Walthall Underpass
15 & 29	1630-01	Fauquier	3.86 Mi. 24' x 10" W. B. Mac. Bit. S. T.
			0.06 Mi. N. of Int. Rt. 17 2.30 Mi. S. of S. C. L. Warrenton
5	2518-01, 2543-01-02-03	Henrico & Charles City	4.75 Mi. 20' x 8" Stab. Base Bit. S. T. & 2 Brs. 8.81 Mi. E. of E. C. L. Richmond 0.35 Mi. E. Henrico-Chas. City Co. Line
40	2790-01, 2791-01-02	Surry & Sussex	1.07 Mi. 20' x 8" Stab. Base & Bridge 0.65 Mi. N. Sussex-Surry Co. Line 0.45 Mi. S. Sussex-Surry Co. Line
58	1775-04-09	Princess Anne	1.60 Mi. 24' x 8" Reinf. Conc. Pave. & Bridge 3.69 Mi. E. of Fleming's Corner 2.07 Mi. E. of Fleming's Corner
39	2708-04-05	Bath	0.59 Mi. 20' x 6" Stab. Base & 130' Br. over Thompsons Creek 0.40 Mi. E. Thompsons Creek 0.22 Mi. W. Thompsons Creek
258	3246-02-03	Isle of Wight	0.19 Mi. 20' x 8" Stab. Base & 40' Br. over Great Swamp 6.67 Mi. S. of S. C. L. Smithfield 6.87 Mi. S. of S. C. L. Smithfield
258	3246-04	Isle of Wight	0.55 Mi. 20' x 8" Stab. Base Bit. S. T. 2.97 Mi. S. of Int. Rt. 460 3.50 Mi. S. of Int. Rt. 460
147	4720-02	Chesterfield	4.00 Mi. 22' x 6" W. B. Macadam Bit. S. T. 1.77 Mi. W. of W. C. L. Richmond Int. Rt. 44 at Robious
617	1357-05 (Contract No. 1)	Mathews	3.37 Mi. 16' x 6" Stab. Base Int. Rt. 224 (N. of Mobjack) Int. Rt. 618 (Near Cardinal)
610	1359-01 (Contract No. 1)	Middlesex	2.74 Mi. 14' x 6" Stab. Base Int. Rt. 640 Int. Rt. 602 (Revis P. O.)
682	1382-07-08	Rockingham	0.30 Mi. 16' x 6" Stab. Base & Br. over Blacks Run 0.20 Mi. N. Blacks Run 0.10 Mi. N. Blacks Run
640	1371-03	Pittsylvania	9.85 Mi. Stab. Base of Soil-Cement Bit. S. T. Int. Rt. 29 0.40 Mi. S. of Int. Rt. 57
629, 666	1324-03	Cumberland	1.55 Mi. Stab. Base (B1 or C) Bit. S. T. Int. Rt. 622 Bear Creek Lake
T 1004	1380-03-04	Roanoke	0.21 Mi. 6" W. B. Mac. Bit. S. T. & N. & W. Overpass 0.20 Mi. N. Int. Rt. 24 Int. Rt. 24

Plans and specifications are on file at the Richmond and Local District Office. Proposal guaranty shall be certified check or bid bond in the amount shown in schedule on back of proposal form. Bid Bond to be on form furnished by the Virginia Department of Highways. The Commission reserves the right to reject any or all bids.

Bids: Feb. 16, 1951 (270)

Concrete Piles and Foundations

NOTICE TO PILING AND FOUNDATION CONTRACTORS:

Sealed bids will be received by the Board of Trustees of the Medical College of the State of South Carolina until 11:00 A.M., Friday, Feb. 16, 1951 in the Baruch Memorial Auditorium of the Medical College of the State of S. C., Charleston, South Carolina, for the construction of cast in place concrete piles and reinforced concrete foundations for the new twelve story teaching hospital. The work consists of approximately 1900 80' cast in place concrete piles and approximately 1600 cubic yards of concrete footings and pedestals.

Plans and specifications and contract documents are open for inspection at the office of Hopkins, Baker, & Gill, Architects, Florence, S. C., and at the office of Dotterer Engineering Company, Charleston, S. C., or may be obtained from them upon the deposit of Twenty-Five Dollars ($25.00). Which check will be returned to the contractor upon submission of a Bona Fide bid and the return of plans and specifications in a good condition to the Architects' office.

All persons or corporations bidding shall be duly licensed by the S. C. Licensing Board, which will include both a General Contractor's License and a Bidder's License.

Bids must be accompanied by a certified check or a bid bond in an amount equal to 5% of the bid. Successful bidder will be required to furnish bond in the sum of 100% of the contract price.

No bid may be withdrawn after schedule closing time for receipt of bids, for a period of thirty (30) days.

The Owner reserves the right to reject any or all bids and to award the job in the best interests of the Owner.

Signed: BOARD OF TRUSTEES, MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA, CHARLESTON, S. C.
BY: Dr. Thomas A. Pitts
President

Bids: January 23, 1951 (258)

Electric Substations and Cables

CONTRACT 428

SEALED BIDS will be received by the Board of Water Supply, at its offices, Fifteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, January 23, 1951, for Contract 428, for furnishing, testing and delivering two outdoor unit substations each having a capacity of 150 Kva. at 60 cycles, 3-phase, and about 300 feet of 3-Kv. electric cable, 3-conductor No. 6, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of one thousand dollars ($1,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, requirements as to surety, etc., can be obtained at the office of the Chief Engineer, Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, JAMES J. MORAN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

SEARCHLIGHT SECTION

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SEARCHLIGHT SECTION

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NEW ADVERTISEMENTS received by January 22nd at the New York Office, 330 W. 42 St., N. Y. 18, will appear in February 1st issue subject to space available.

ESTIMATOR

Must have broad experience in estimating for construction of oil refinery or chemical plants. Long term, high priority project.

CATALYTIC Construction Co.
1528 Walnut Street
Phila., Pa.

ESTIMATOR

Experienced in quantity survey on Fire Brick, Steel and Concrete wanted by well-established steel plant engineering and contracting firm specializing in open hearths and reheating furnaces. Permanent work. Location downtown Pittsburgh. Apply by mail.

SUITE 300
610 Smithfield St., Pittsburgh 22, Penna.

Construction Superintendent & Engineer

Wanted by well-established national organization. Must be graduate of technical college, and experienced in building construction and installation of equipment. Experience in chemical plants helpful. Must be willing to travel in continental U. S.; state salary expected, and give detailed experience, together with age and education. Write Box EN 1374, 221 W. 41 St., N. Y.

CLASS OF 1951

Civil or Mechanical Engineers with or without experience for N. J. highway design and construction, salary $2760–$3600. Opportunity for permanent Civil Service positions and advancement. Examinations open to citizens of U. S. Write Division "E", N. J. Dept. Civil Service, State House, Trenton, N. J. Closing date for applications January 31, 1951.

WATER POLLUTION CONTROL ENGINEERS

3—5 years experience related to treatment and disposal sewage and industrial waste plus degree in engineering or additional qualifying experience. Must be eligible for Calif. State License. Positions in Calif. State government. Starting salaries $4980 and $5772 per year. Official applications must be filed by March 10.
Write now to Dept. B, Recruitment Section, State Personnel Board, 1015 L Street, Sacramento 14, California.

RIGGING SUPERVISOR

Large east coast refinery seeks rigging department supervisor. Require sufficient engineering background to supervise rigging operations in construction & maintenance work. Capable of directing large staff. Complete working knowledge of heavy mechanical equipment required. Write giving age, experience & salary desired.

P-8671, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

ADDITIONAL POSITION VACANT ADVERTISEMENTS ON PAGES 92 & 93

STRUCTURAL ENGINEERS

New York engineering organization specializing in design and construction of power plants, and industrial structures, desires engineers thoroughly experienced all phases of structural design, correlated with architectural design: Planning, assigning of work, supervision of design, writing of specifications, and requisitioning of materials. Applicants preferably at least 40 years old, with about 15 years' general field and office structural experience. Please submit resume to

P-8681, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

City of West Palm Beach, Florida is seeking CITY ENGINEER

REQUIREMENTS ARE: Registered Engineer, preferably in Florida but registration must be such that Florida registration may be obtained under State law. Additional desirable qualifications to be Registered Land Surveyor. Salary of present City Engineer (resigned) $5400 per annum. Appointment will be made as soon as possible.

Contact: CITY MANAGER

CITY OF DETROIT

Engineers experienced in the design and construction of water works needed for $38,000,000 project. Starting salary $4,382, $5,204, $5,736, $6,586 per year with annual increases. Submit resume of experience with application request.

DETROIT CIVIL SERVICE COMMISSION
1501 Water Board Building
735 Randolph Street, Detroit 26, Michigan

GENERAL SUPT.

Permanent. Experienced in Pavements, Structural Concrete, Pile Driving and Heavy Concrete Work. Chicago resident preferred. Salary and Bonus. Replies Confidential.

P-8675, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

DESIGNERS, DRAFTSMEN - ELECTRICAL - MECHANICAL - STRUCTURAL. JOB LOCATED IN MIDDLE WEST. EXCELLENT WORKING CONDITIONS. GOOD SALARY. OLD ESTABLISHED COMPANY.

P-8339, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

Structural Designers and Detailers

with at least three years experience wanted by well-established steel plant engineering and contracting firm specializing in constructing open hearth furnaces. Apply by mail.

SUITE 300,
610 Smithfield Street, Pittsburgh 22, Penna.

SALARIED POSITIONS $3,500—$35,000

We offer the original personal employment service (established 41 years.) Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.
R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

CIVIL SERVICE

POSITION OPEN—City Superintendent wanted by city of Zeeland. (Pop. 3800). Will have charge of Diesel power generation plant (3600 KW), power, light and water distribution systems, sewers and disposal facilities consisting of activated sludge treatment plant and digester, streets and parks. One with engineering training or experience in these duties preferred. Salary depending on qualifications. Address E. J. DePree, 134 E. Central Ave., Zeeland, Mich.

POSITIONS VACANT

PURCHASING AGENT—Large General contractor on Atlantic Seaboard wants a purchasing agent experienced in purchasing and expediting construction materials and equipment, subcontract and specialty items. Reply immediately stating age, education, experience, references and when available. Permanent position for qualified man. Will discuss salary when interviewed. P-8615, Engineering News-Record.

CONSTRUCTION COORDINATING office and field, superintending, plans, specifications, expediting Institutional Buildings Long Island. Must be thoroughly experienced, accurate, industrious. State references, salary, availability. P-8636, Engineering News-Record.

WANTED: CONSTRUCTION Superintendent. Construction Company located in Central Connecticut has opening for an A-2-1, experienced Job Superintendent for heavy concrete construction, including Bridges, Roads, Dams, etc. Must be capable to handle job from start to finish, handling all phases of the work. Must have excellent record for character, experience and production. When answering give full information, including past experience and availability. Salary secondary to procuring the right man. P-8621, Engineering News-Record.

CONSTRUCTION MEN—Construction superintendents, field engineers, field clerks preferably with experience in chemical plant and processing equipment. Locations in various States. P-8618, Engineering News-Record.

FIELD ENGINEERS: Experienced in design and control of asphaltic concrete mixtures and the construction of bituminous base courses and asphaltic concrete pavements, for field inspection on construction in the East State age, experience, salary expected and when available. P-8600, Engineering News-Record.

ENGINEERS WANTED for industrial fire prevention field work by national insurance organization with offices in most major cities. These are permanent jobs with good future, but candidates should appreciate that extensive away-from-home travel is involved. Age 26-40 preferred. P-8306, Engineering News-Record.

GENERAL CONSTRUCTION Superintendent, Project and Field Engineers, Piping Superintendent, and Carpenter Superintendent wanted, experienced in Hydroelectric dam and powerhouse construction, work located in Latin America, advise age, experience, reference, and availability, address P-8683, Engineering News-Record.

(Continued on page 93)

ENGINEERS

ELECTRICAL - MECHANICAL - STRUCTURAL

Openings in Ohio offices offering long term employment with good salary for qualified Group Leaders, Designers and Draftsmen experienced in one or more of the following phases of industrial plant design:

Electrical Power, lighting layouts and electrical controls.

Mechanical Plant layout, process piping, conveyors, heating and ventilation, boiler houses, process equipment layout, refrigeration, plumbing, tanks and vessels, packaging equipment, special machinery and equipment.

Structural Structural steel and reinforced concrete.

Please submit complete resume stating experience, education, salary required and availability date.

THE H. K. FERGUSON COMPANY
Engineers and Builders
The Ferguson Building, 1783 East 11th Street Cleveland 14, Ohio

ENGINEERING

We anticipate increasing our engineering organization during the next several months for the design of Oil Refinery, Blast Furnace, Open Hearth, Steel Mill and Power Plants.

These men should be qualified as draftsmen, designers, checkers or higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, platework, heavy mechanical equipment and electrical.

If you are interested and have engineering design experience on this class of work, write to us for a personnel form for prompt consideration of your qualifications.

This work is in our Cleveland office, and is on a 5-day, 45-hour week basis, with time and one-half over 40 hrs; also, vacation and holiday pay. Steady employment and a good opportunity with a good organization.

ARTHUR G. McKEE & CO.
2300 Chester Ave.
CLEVELAND 1, OHIO

CONSTRUCTION MEN WANTED IMMEDIATELY

Applications desired by large nationally known heavy works contractor headquartering Midwest for several positions as Area Construction Managers or Assistants, also Construction Project Managers and Superintendents on competitive bid, negotiated, or fee projects located generally Eastern half of U. S. A. or Overseas.

We require only men of mature and successful engineer construction experience and high degree of organizing, administrative ability, with good health and energy. Thorough knowledge of men, methods and machinery, specializing grading, structures, surfacing, highways, railroads, dams, airbases, etc.

Permanent positions with good salaries and away from home expenses with substantial commission bonus prospects to men of unusual ability. Please submit complete resume elaborating on experience, education, salary required and date of availability. Will acknowledge applications.

P-8666, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

Engineers Wanted

Civil—Electrical—Mechanical—Structural

***Apply* KAISER ENGINEERS**
Division of Kaiser Industries, Inc.
1924 Broadway Oakland, California

Assistant General Manager For New Metal Working Plant

Assist in general supervision of office and plant that will employ about 30 persons and that will have potential capacity of approximately one million dollars worth of work per year. Will have responsibility for preparing estimates to be used in bidding on contracts.

Mechanical engineering plus at least five years of shop experience are desired. Salary is open. State full qualifications and give recommendations in first letter. Address all communications to North Carolina Metal Products Company, 1100 South Elm Street, Greensboro, North Carolina.

CONCRETE-HYDRAULIC ENGINEERS

New York engineering organization, specializing in design and construction of power plants and industrial structures, desires engineers thoroughly experienced in design of heavy reinforced concrete foundations, steam and hydro-electric power plant structures, dams, and other hydraulic structures. Work will include planning, assignment of work, supervision of design and specification writing. Applicants preferably at least 40 years old with about 15 years' general field and office experience. Please submit resume to

P-8680, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

WANTED

TWO STRUCTURAL DETAILERS — CHECKERS

Permanent jobs for good men with experience in all types of bridge and building work. Apply by letter giving resume of experience and salary desired.

Paxton & Vierling Iron Works
P. O. Box 1085 Omaha, Nebraska

SANITARY ENGINEERS

California offers opportunities for professional advancement in this field. 2 years experience sanitary or public health engineering plus engineering degree or additional qualifying experience.

Salary $341 - $415

Write today Recruitment Section, Dept. ASE
STATE PERSONNEL BOARD
1015 L Street Sacramento, California

Plant & Maintenance Engineer

Wanted, by national organization, for Middle Atlantic location, graduate engineer, thoroughly experienced in plant engineering and maintenance. Must be free to travel. Give age, details of experience, salary expected, and when available for work. Write Box EN 1378, 221 W. 41 St., N. Y.

DESIGNERS

Experienced in
hydro electric power plants.
CORBETT-TINGHIR CO.
39 Broadway N. Y. 6, N. Y.

CONSTRUCTION SUPERINTENDENT

Thoroughly experienced in industrial work wanted by well established Pittsburgh Steel plant engineering and contracting firm specializing in open hearth furnaces. Permanent work assured through large amount of work on hand. Apply by mail.

SUITE 300.
610 Smithfield St., Pittsburgh 22, Penna.

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Monthly payments permissible. Information sent without obligation. WRITE TODAY

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College House Offices • Harvard Square • Cambridge, Mass., U. S. A.

POSITIONS VACANT
(Continued from page 91)

ESTIMATOR For quantity takeoff and with knowledge of checking details for permanent position with old established building construction company located at Allentown, Pa. Good apartment available if desired. State qualifications and approximate salary desired. H. E. Stoudt & Son, Inc., 1212 S. Fifth Street, Allentown, Penna.

STRUCTURAL STEEL Detail Draftsmen and Checkers. Al types of structures. Vacation and bonus plan, group insurances, good working conditions. Only top quality men. Send complete written information. Samborn, Steketee and Associates, 1214 Cherry Street, Toledo 2, Ohio.

CONSTRUCTION SUPERINTENDENT for Mid-Western General Contractors. Must be capable of supervising all types of construction work. Excellent opportunity for one who qualifies. Reply stating age, experience and references to Perron Construction Company, 6525 Lincoln Avenue, Detroit 2, Michigan.

POSITIONS WANTED

CIVIL ENGINEER, Registered Massachusetts, member ASCE, sixteen years excellent experience construction supervision, administration and organization. Limited design experience. Age 38, married, one child. Good health. Location immaterial. Salary open. PW-8597, Engineering News-Record.

CONSTRUCTION SUPT. or Foreman, Trunk and Interceptor Sewers. Payroll Chief, or Expediter. 16 years pipe lines construction supervision. PW-8626, Engineering News-Record.

CHIEF STRUCTURAL and Architectural engineer, 25 years experience in the design and construction of industrial structures and power plants. PW-8628, Engineering News-Record.

EXECUTIVE ENGINEER, administration, estimating, cost control, planning. BS and CE degrees. Registered. 20 years in design and construction of process plants, subways, dams, buildings. Now working in N. Y. City. About $10,000. Resume on request. PW-8653, Engineering News-Record.

TECHNICAL WRITING by experienced editor-engineer will do ghost writing, technical editing, preparation of reports. PW-8657, Engineering News-Record.

GENERAL CARPENTER-Foreman 30 years on concrete dams, industrial plants, steel mills, hospitals, schools and bridges. Good union connections, available soon. PW-8693, Engineering News-Record.

PART TIME WORK WANTED

PENNA REGISTERED Civil Engineer specializing water supply and sewerage has survey crews and small staff available for sub-contracts anywhere in eastern U. S. PTWW-8654, Engineering News-Record.

PATENT ATTORNEY

Patent Practice
before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 454, 815-15th Street, N. W., Washington 5, D. C.

WANTED
POSITION IN FLORIDA
By a Registered Engineer with 20 Years' varied construction experience, as Chief Estimator, General Superintendent, Construction Engineer, Contractor's Assistant or Partner.
PW-8691, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

LEARN TO ESTIMATE

Today, more than ever before, you must know how to analyze building costs. If you want to become a successful builder, learn how to prepare a correct estimate in a hurry. Get in on the profitable work now available wherever you turn. Your success is assured if your estimates are right; otherwise you are licked before you start.

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IMMEDIATE SHIPMENT

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A.C.—50 AND 60 CYCLES

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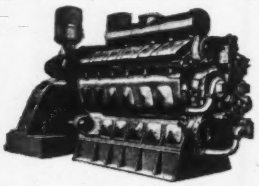

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1250	General Motors	16-278A	1600	720	312	General Motors	8-268A	450	1200
937.5	General Motors	12-567	1080	720	312	Clark	MD-4	375	327
625	Alco	6-12¼x13T	750	600	125	General Motors	3-268A	150	1200
425	Baldwin	VO-6	510	450	75	General Motors	6043C	90	1200
400	Buckeye	80	480	600	62.5	Int'l Harvester	UD-18	76	1200

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20 Koppel 20 yard air dump cars
50 ton American steel stiffleg derrick
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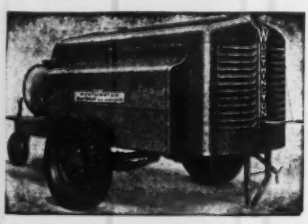

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SINCE 1902

FOR SALE

5-LJ Mack's with 9 yd. end dump rock boxes. 611 cu. in. motors, 12 x 24 tires. Twin Hoists. Good condition. Reasonable.

FOR RENT

1—80 D Northwest Shovel 2½ yd.
Murphy Diesel. Late Model A-1.
1—#6 Northwest Crane and shovel combination.
Murphy diesel (new machine).
1—500 Cu. ft. Air Compressor.
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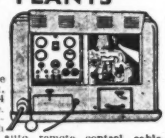

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1—Jaeger 5½ HMTL Top Loader High Dump Truck Mixer Serial #J-10793 purchased new October 1949, powered with Continental F-226 Engine #47107. Mounted on 1943 White Serial #279875 Cummins Diesel Engine #330837

1—1947 Brockway Tractor Serial #33591 Engine #46B1206

1—1948 Gramm Dump Semi-Trailer 18 yd. Body, Model DF85 #751459704

1—1945 Gramm Platform Trailer 20' Body Model DF75 #752256702

1—16 wheel Low-bed Trailer

1—Northwest Crane Model 104 Serial #1804

1—1947 Scoopmobile #24587, Model B

2—1944 Dodge Weapons Carriers WC51-T214-40363 WC51-T223-49123

1—1947 Ford ¾ Ton, 122" Stake Body, Engine #799Y 1654297

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1—Jaeger 3½S Portable Mixer #87140

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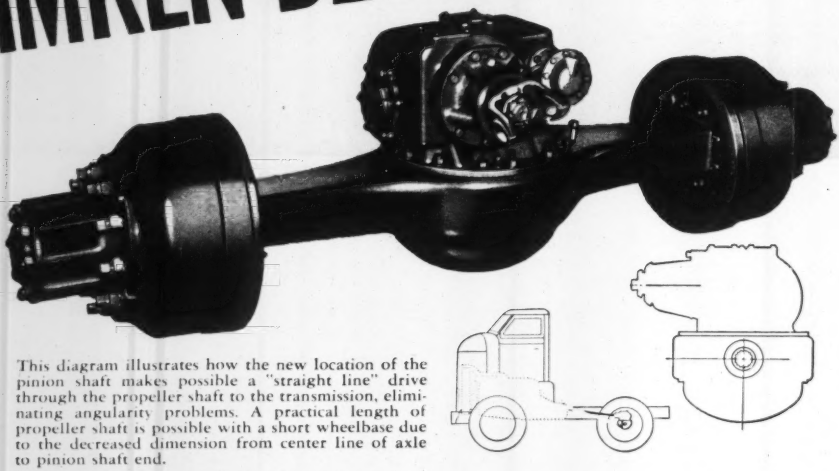

This diagram illustrates how the new location of the pinion shaft makes possible a "straight line" drive through the propeller shaft to the transmission, eliminating angularity problems. A practical length of propeller shaft is possible with a short wheelbase due to the decreased dimension from center line of axle to pinion shaft end.

A NEW TWO-SPEED, DOUBLE-REDUCTION AXLE WITH THE FINAL DRIVE TOP-MOUNTED FOR SHORT-WHEELBASE TRUCK-TRACTORS!

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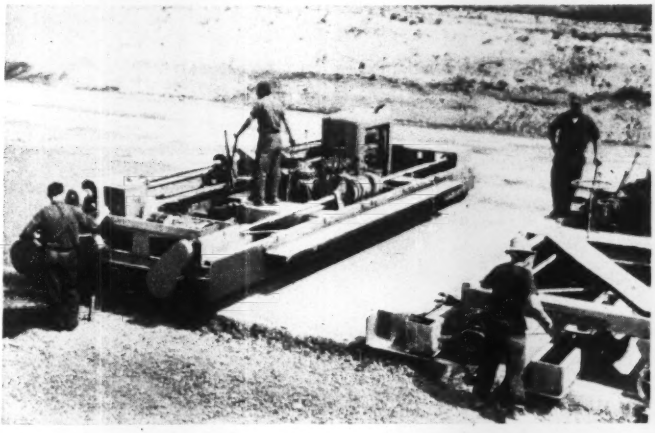
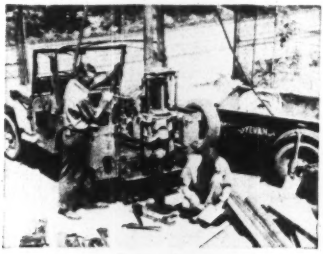


Spreader combines screed and compacting screw

SCREW-SCREED concrete spreader is available in two models with widths of 10 to 15 ft and 20 to 25 ft. The combined 12-in. oscillating, transverse screed and remixing-compacting screw spreader provide the triple function of spreading, initial strikeoff, and precision metering of concrete for the following finisher. The spreading screw is said to completely eliminate honeycombing and segregation. Strikeoff plate behind the screw makes initial strikeoff to approximate grade line; the screed then makes a precision strikeoff and meters correct amount of material to the following finisher. With no deficiencies or excesses of material, finisher can work farther back from the spreader, permitting concrete to condition properly. The screw-spreader can spread and strikeoff base course with the screed raised and inoperative. Both models offer 5-ft adjustability in 6-in. stages. Spreading screw on the 10 to 15-ft model is instantly reversible for spreading material toward either side form. On the 20 to 25-ft model, the screw is divided and permits spreading from center to side forms, side forms to center, or toward either side with both halves operating.—THE JAEGER MACHINE CO., 200 DUBLIN AVE., COLUMBUS 16, OHIO.

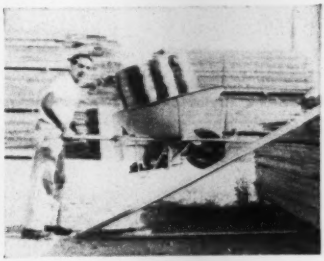


Jeep-mounted drill

Penndrill Jeep is rated at 450 ft of NX hole (2⅛-in. core) or up to 1,000 ft of EX hole (1⅝-in. core). Recommended applications include foundation test borings, grout-hole drilling, and other shallow-hole requirements. Power for the diamond core drill is provided by the Jeep's take-off. Unit is available with hydraulic or screw-feed swivelheads. An aluminum mast is available as optional equipment. Drill is easily detached permitting general use of the Jeep.—PENNSYLVANIA DRILLING CO., INC., 1201 CHARTIERS AVE., PITTSBURGH 20, PA.

Drum and barrel covers

Neoprene-impregnated paper covers fit standard 55-gal drums. The covers are single-ply, 2 ft in dia, and have a 4-in. skirt hemmed with an elastic band around the bottom. When slipped over the drum, the elastic holds the cover in place keeping the contents dry and clean. The covers will be available in other sizes and shapes if demand warrants.—CHASE BAG CO., 309 W. JACKSON BLVD., CHICAGO 6, ILL.



Powered wheelbarrow

Self-powered wheelbarrow has an air-cooled engine mounted beneath the bed. Drive is provided by friction on the tire tread; braking, by compression. Controls are located on the right-handle bar. The Pow-R-Barrow is said to pull a full load up a 40% grade.—S & S VENDING MACHINE CO., SAN JOSE, CALIF.

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Cement-mortar lining service for old, small-diameter pipe lines is said to result in new pipe line performance. Work can be carried out on pipe lines in place without discontinuing regular service. Corroded matter and tubercles are cleaned out before the Tate process cement-mortar lining is applied.—PIPE LININGS, INC., SUBS. OF AMERICAN PIPE & CONSTRUCTION CO., P. O. BOX 3428, TERMINAL ANNEX, LOS ANGELES, CALIF. In the east, CENTRILINE CORP., 140 CEDAR ST., NEW YORK 6, N. Y.

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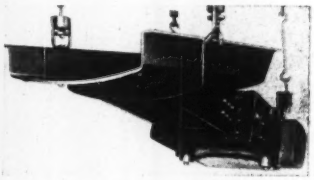

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Leaf springs, armature, and core of Vibra-Flow feeder are covered by gasket-sealed plates bolted to the magnet casting resulting in a dust-tight design. Enclosing these parts provides protection against clogging by excessive supply hopper spillage or heavy dust conditions. Feed rates range up to hundreds of tons per hour when handling dry, damp, hot, cold, fine, or coarse materials.—SYNTRON CO., 328 LEXINGTON AVE., HOMER CITY, PA.

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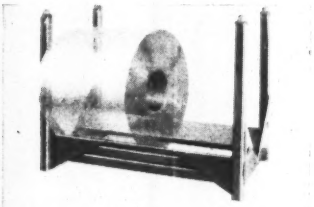

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Super Seal compound for sealing asphalt pavements is processed from a special tar into an emulsion that

(*Continued on page 105*)

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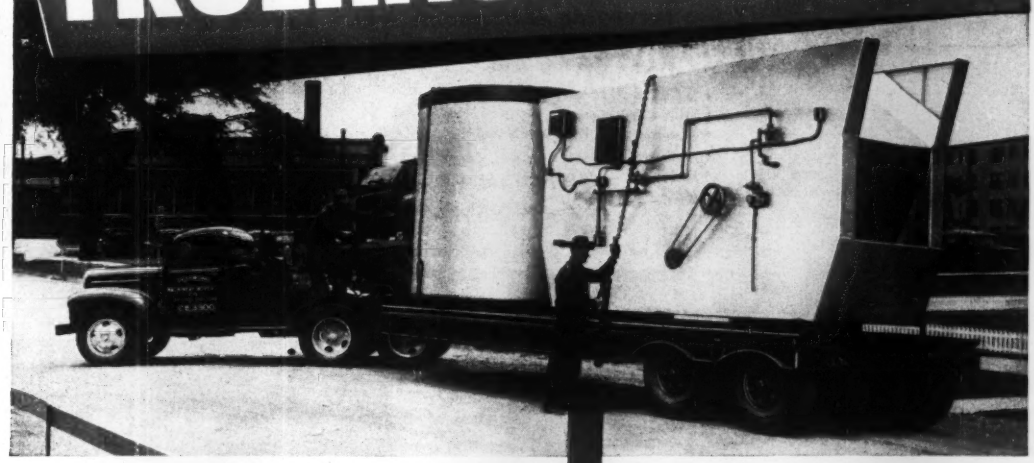

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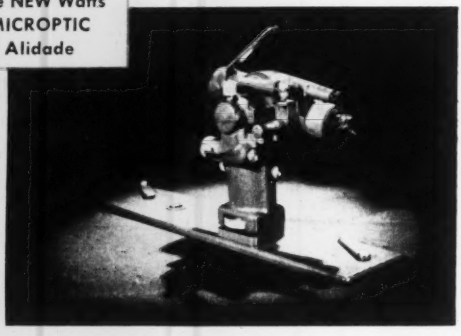

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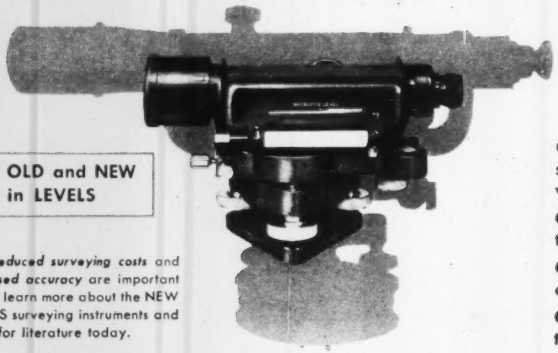

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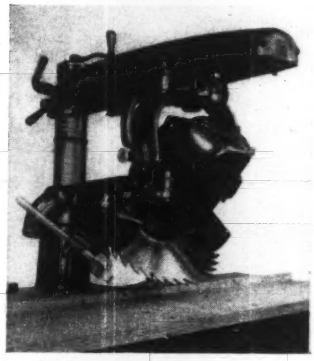
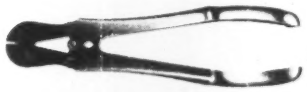


Radial-arm saw

Improved Model GR radial-arm saw features a low-dead-rise direct-drive motor, resulting in a reduction in the distance from the extreme bottom of the motor casing to the saw arbor. This allows the feeding of thicker stock (up to 4½ in.) using a standard 14-in. saw blade. The totally enclosed construction reduces its danger as a fire hazard. It is available in standard and medium-arm sizes with motors ranging from 2 hp ac/dc to 3-hp single-phase, and from 3 to 5 hp polyphase.—DEWALT, INC., LANCASTER, PA.



Bolt cutter

Manco 15-in. bolt cutter is said to have a capacity equal to that of a standard 18-in. cutter (¼-in. dia). High-quality tool steel is used for the jaws; 14-gage steel stock for the handles. The jaws are easily replaceable and resharpened when required.—MANCO MFG. CO., BRADLEY, ILL.

Raw material calculator

Metal rod and flat stock requirements can be determined directly from blueprints with this slide-rule-type calculator. All markings on the Vinylite calculator are covered with a transparent piece of the same material to prevent wear. Measuring 2 x 11-in.,

(Continued on next page)

Hendrick Open Steel Flooring . . .

gives you these outstanding advantages—

90% open area for light and ventilation . . . rectangular, square-edge steel bars that provide a safe, non-slipping, level walking surface . . . pressure-formed Mitco construction that obviates weaknesses of bolts, rivets and angle irons . . . no welds, with liability of residual stresses that lead to warping . . . ample strength to support heavy loads without any lateral deflection of flooring. Write for Hendrick Mitco Products Catalogue.

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MODEL CVS

Here at the Willimantic, Conn., plant of the American Screw Company, Builders Visible Flow Chlorinizer is handling a tough job — and doing it well! The Chlorinizer feeds chlorine gas at the exact rate required for the treatment of cyanide wastes. As in many other industrial waste treatment plants throughout the country, this dependable chlorine gas feeder has been selected for its safety, accuracy, and reliability.

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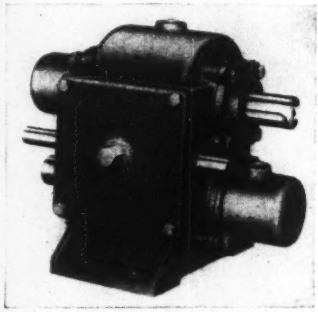
the device computes information needed for rod and flat stock in various shapes and sizes and in any length.—H. R. Potter Co., P. O. Box 318, Montclair, N. J.

Toolroom lathe

Precision lathe is recommended for sensitive instrument work and heavy-carbide cutting. The Model 1020S handles any turning within its 12¼-in. swing and 20-in. centers. Headstock back-gearing speeds range from 22 to 400 rpm.—Rivett Lathe & Grinder, Inc., Brighton 35, Boston, Mass.



Two-speed hanger bearing

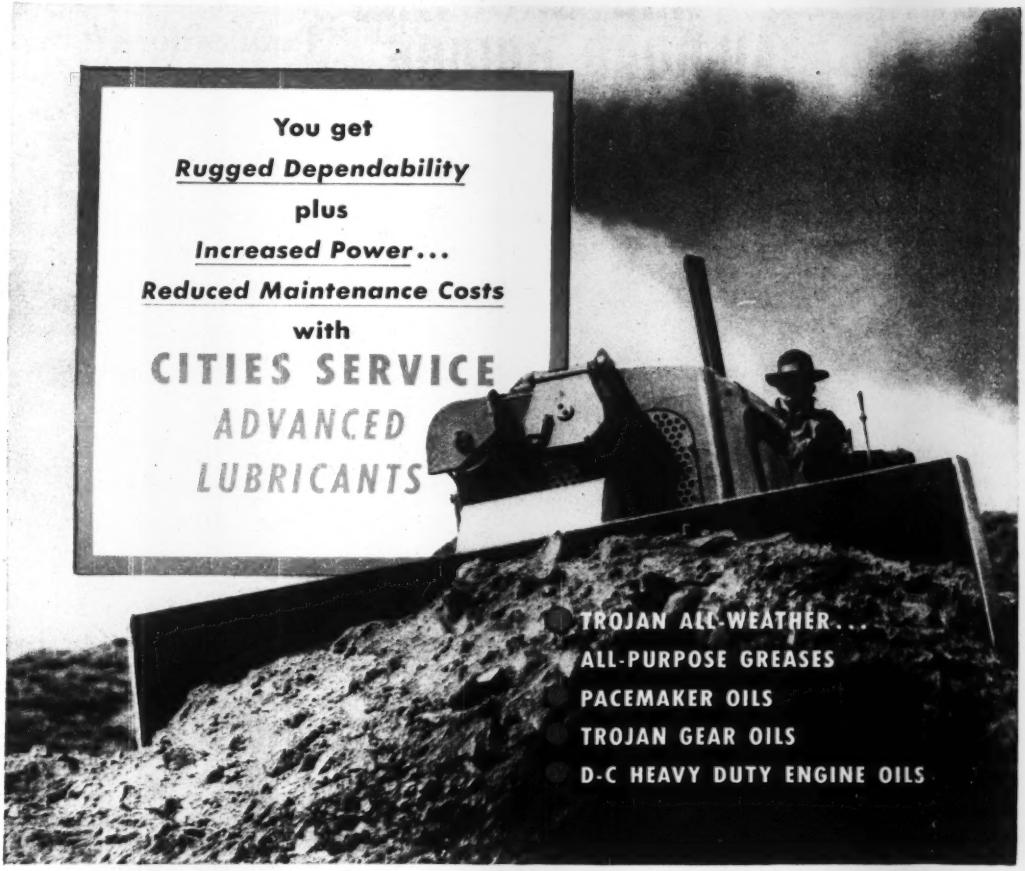
Simple gear box provides two output speeds for one input speed. It is used primarily for doubling the speeds of the take-off mounted on truck transmissions, and driving both a winch and a pump installed on the same vehicle. Maximum input torque is 300 lb/ft; maximum input speed at maximum torque is 500 rpm; maximum input horsepower for steady load is 45.—Tulsa Winch, Div. Vickers, Inc., Tulsa, Okla.

New Product Briefs

Mercury lamp reflector features Alzak aluminum construction. This 3-kw reflector provides 55-deg crosswise shielding. Made by: The Edwin F. Guth Co., St. Louis 3, Mo.

Pressurized fire extinguisher discharges a vaporizing liquid. Requires no pumping, can be one-hand operated, has a 1-qt capacity, aims like a gun, and has a trigger-type action. Maker: American-LaFrance-Foamite Corp., Elmira, N. Y.

Pro-Tex-Tire compound is said to prolong tire life, impart coolness, and assure easy tire changes. Non-toxic and non-inflammable, it is applied by brush to inside of tire and to the rims. Made by: American Sand-Banum Co., Inc., New York 20, N. Y.



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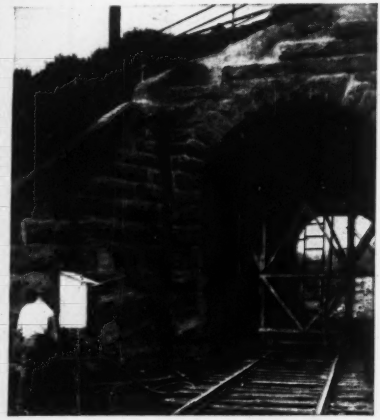
Pictured here is a type of vital repairing in which we are specialists. It has proven to be a most effective method for filling voids behind tunnel linings and solidifying bridge abutments, piers and arches.



This grade separation between the NYO&W and DL&W railroads was so greatly weakened by heavy traffic that ballast from the upper track sifted through the joints in the masonry. After pointing all joints with "GUNITE" a system of holes was drilled through the masonry. Through these we pumped sand-cement grout, completely filling all voids and joints. This built up the structure to greater than original strength.

Pressure grouting is but one of the operations we have teamed with "GUNITE" for successful repair and construction of many kinds. Bulletin (A) 2400 shows many of them. A request on your letterhead will bring you your copy promptly.

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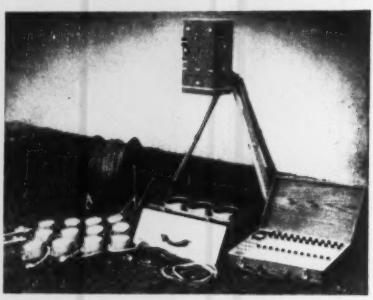

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Manufacturers' Publications

Piping-engineers chart—Wall card is designed to aid piping engineers in selecting fittings and flanges. It contains complete information on a line of seamless welding fittings and forged steel flanges. Fittings listed include long-radius WeldELLS, short-radius WeldELLS, caps, stub ends, concentric and eccentric reducers, and straight and reducing tees. Data listed on the flanges cover a range varying from 150 to 2,500 lb. Data is also presented on welding neck flange bores.—TAYLOR FORGE & PIPE WORKS, P. O. BOX 485, CHICAGO 90, ILL.

Copper roofing—Master specifications for copper roofing and sheet metal work in building construction are available in booklet form. These specifications are provided as a guide to sheet-copper installation methods. They are based on a 1-year program of design development and test combined with field investigations. Distributed with the specifications is another booklet discussing design principles and techniques of sheet-copper construction.—REVERE COPPER & BRASS, INC., 230 PARK AVE., NEW YORK 17, N. Y.

Apprentice training—Pocket-size pamphlet outlines ten ways in which apprenticeship is said to net worthwhile returns. In addition, the pamphlet lists other publications on the subject of apprenticeship; regional offices of the Bureau of Apprenticeship, U. S. Dept. of Labor; and State apprenticeship agencies.—BUREAU OF APPRENTICESHIP, U. S. DEPT. OF LABOR, WASHINGTON 25, D. C.

Passenger elevators—Buyer's Guide for Passenger Elevators is available for consulting engineers or architects planning elevator installations. Designed as a reference book, the information is comprehensive and is presented with numerous pictures, diagrams, curves, tables, and case examples.—WESTINGHOUSE ELECTRIC CORP., ELEVATOR DIV., JERSEY CITY, N. J.

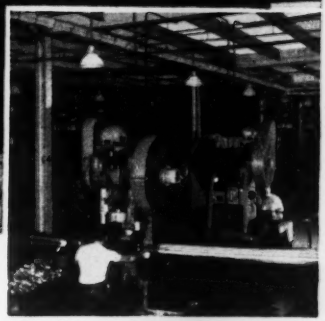
Welding buyers guide—Booklet covering alloys and fluxes for welding, brazing, soldering, cutting, and tinning contains information of help to buyers without previous experience or highly technical training. Data is organized and cross-referenced to make the correct selection practically automatic. The information is listed according to the base metal, welding

(Continued on page 111)

Scranton, Pa., Builds for the Future with LIGHT-WEIGHT EASY TO INSTALL J & L JUNIOR BEAMS

J&L STEEL

A typical example of steel framework in one of the LIFE plant buildings. Junior Beams contribute vitally to the ease and speed of construction.



Interior view of completed plant occupied by the Eastern Mfg. Div., The Trane Co., showing Junior Beam roof purlins in the economical ceiling construction.

JUNIOR BEAM ROOF PURLINS SAVE TIME AND MONEY IN CITY'S PLANT CONSTRUCTION PROGRAM

The citizens in the area of Scranton, Pa., have embarked on a farsighted program of industrial plant construction. They call it Lackawanna (County) Industrial Fund Enterprise—LIFE. Its aim is to attract new industries which will provide the district's unemployed with sorely-needed jobs.

Early in the program, the Anthracite Bridge Company, Scranton, worked out an economical building system which has been used in almost every new plant erected.

J&L Junior Beams play an important role in making this low-cost, speedy construction possible.

For example, in Building No. 1 of LIFE's program light-weight Junior Beams were installed as roof purlins. A five-man crew with a light truck-crane plus another five-man "bolting-up" crew erected the entire steel framework of the 180' x 460' building *in less than 10 days!*

The uniformity of Junior Beams made them readily adaptable to variations in design, and their ease of handling further speeded construction—two factors that *saved time and money on the job.*

Junior Beams, produced exclusively by Jones & Laughlin Steel Corporation, are easy to install, require no fabrication other than end connections and bolt holes. They are rigid, vibration resistant, shrink proof, and have a lower deflection factor than other structural sections of equivalent weight.

Why not write today for our new booklet: "Skyscraper Construction for Every Building?" It shows how Junior Beams are used as floor joists, and roof purlins with erection details, specifications, loading and spacing tables.

Jones & Laughlin Steel Corporation
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Please send me a copy of the booklet entitled, "Skyscraper Construction for Every Building."

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processes to be used, and working temperatures and strengths involved. —All State Welding Alloys Co., Inc., 273 Ferris Ave., White Plains, N. Y.

Revolver cranes—Illustrated booklet (24 pp) features large, dramatic pictures of some of the nation's greatest dam jobs including Garrison, Friant, Grand Coulee, and Bull Shoals. These pictures illustrate how contractors, engineers, and construction men use the power and reach built into these revolver cranes.—American Hoist & Derrick Co., 63 Roberts St., St. Paul 1, Minn.

High-strength cast-iron welds—Data sheet supplies up-to-date information on uses and applications of EutecRod 14FC, a welding rod for high-strength welds on cast iron by oxy-acetylene torch methods. Illustrated with typical case histories, the data sheet also contains a listing of physical properties of the alloy.—Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.

Conveyor and elevator belts—Catalog section (26 pp) features illustrations portraying in detail all major parts used in construction of conveyor and elevator belts. The booklet describes belt features, explains why increased service life with decreased maintenance are made possible by the Goodrich construction, and tells the function that each part of the belt performs. Significant data is provided on each belt in the company's line.—The B. F. Goodrich Co., Akron, Ohio

Street-lighting poles—Catalog (36 pp) on street lighting poles lists nearly 500 design combinations. Pertinent engineering data combined with simplified specification tables give complete data on standard mounting heights, bracket spreads, and pole sizes available. All of the poles referred to are illustrated in clean-cut detail drawings.—The Union Metal Mfg. Co., Canton 5, Ohio.

Roof repairs, maintenance—Folder entitled "Roof Savers" tells how to prolong the life of a roof and how to repair accidental damage. Pictures illustrate roofs in various stages of deterioration, and text explains the proper treatment to follow in each case. The folder includes a discussion of why roofs wear out; an illustrated explanation of the principal ingredients used in roof savers and what each contributes; suggestions on application; and data on container sizes, weights, and coverage.—Johns-Manville, 22 E. 40th St., New York 16, N. Y.

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Letter from MIAMI

Building all types of shelter—homes, hotels and apartments—has kept the construction industry in and around Miami and Miami Beach, Fla., operating at a fast pace ever since war restrictions were lifted at the end of World War II.

The annual rate of construction in Dade County, (which includes, Miami, Miami Beach and many small suburbs) has been at or near $150 million, according to Paul H. Hinds, executive manager of the South Florida chapter of the Associated General Contractors. For the first six months of 1950, Mr. Hinds figures that the total was around $100 million.

Some of this record figure, of course, has been industrial and commercial building, but hotels, apartments and home building have set the pace. The demand never has been satisfied—it still appears insatiable!

• **Spectacular**—Hotel construction out on Miami Beach is the most spectacular part of this activity. Land with ocean frontage is so valuable that tall narrow structures are the rule. And because construction noises during the winter season are not permitted to disturb guests who pay fabulous prices to stay in those ocean-front hostelries, speed of construction takes on a new meaning for building contractors.

No construction at Miami Beach may start before April 1 on any structure within 150 ft of an occupied hotel, and all the louder construction noises—which are characterized as Class A noises in a noise ordinance—must be over before the following Nov. 15. By Dec. 15 the new building must be fully enclosed so that the lesser noises that still are necessary will not annoy the neighbors.

A typical example of resulting speed is the Saxony Hotel—one of the most luxurious of the new structures. Work on that 17-story structure was begun April 1, 1947, and the hotel received paying guests that Christmas, although it was not entirely completed.

In contrast to this hotel-building boom over on Miami Beach, Miami itself—which had its hotel boom in 1925, before the 1929 depression—is seeing the first major hotel built on its waterfront in 25 years. Miami's boom has been home building.

• **Concrete predominates**—Concrete is the dominant construction material on all this work. Structural steel is used in the frames of some of the high buildings, but reinforced concrete goes into nearly all other structures, and concrete blocks are used almost exclusively for walls. (Brick is expensive and scarce.) Standard size blocks cost 16½ cents. Ready-mix concrete runs from $11.25 a yard to $12.50. Almost no concrete is mixed at the job.

An unusual characteristic of this work is the fact that even one-story houses are built with frames of reinforced concrete. This is done to give them stability in storm winds. Concrete blocks are filled in between the columns to form the entire wall. Roofs are securely anchored to the reinforced concrete frames by straps set in the fresh concrete.

A common practice in one and two story structures is to build up panels of concrete blocks in exterior walls to a height of one story in advance of forms for the frame, leaving openings for the columns. That cuts the form required for the columns in half and makes unnecessary a bottom form or supports for tie beams in the exterior walls.

Another labor-saving plan gaining acceptance is the use of precast concrete frames for windows. These frames are set in the concrete block walls as they are built, becoming an integral part of the wall. Similar frames also are used for exterior doors.

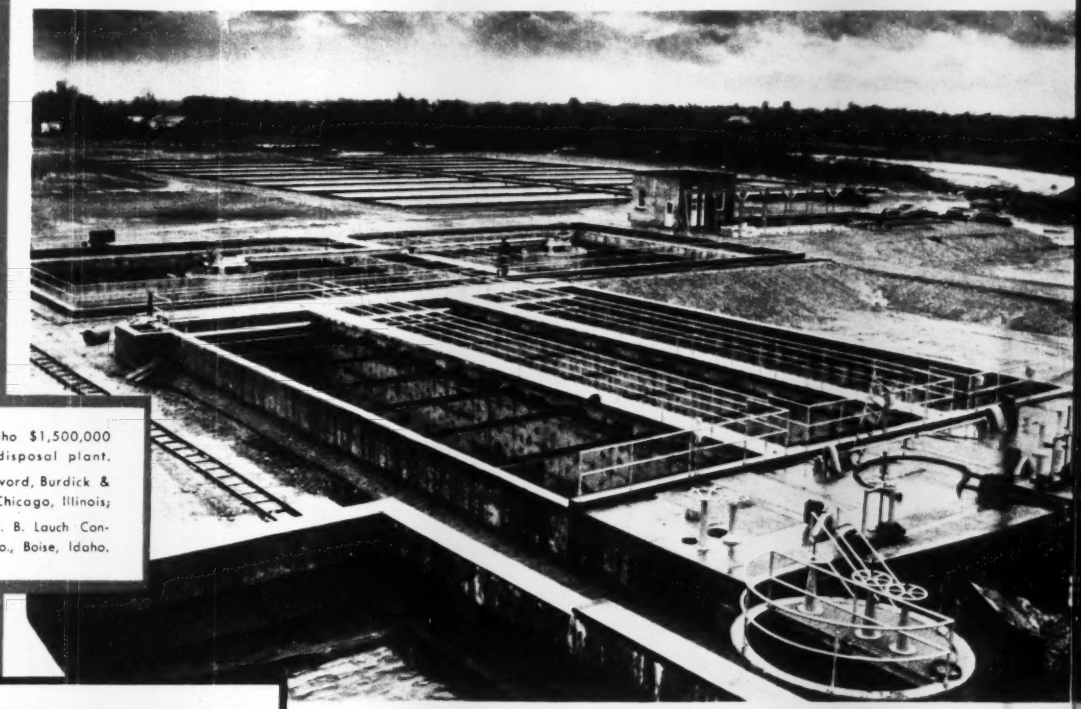
• **Precast walls**—A new experiment in concrete construction is the use of precast concrete slabs, in panels a full story in height, for the exterior walls of a professional building now nearing completion in Miami. The exterior faces have a special finish of crushed quartz and white cement, which is designed to eliminate the painting that is required on most of the city's many stucco finished buildings.

On the labor front, under a new agreement all trades except carpenters and floorlayers got a wage hike of 10 cents this month, and are due for a 15 cent rise in addition this April first.

HOTELS STAND SHOULDER TO SHOULDER along the costly ocean frontage of Miami Beach. Work on the Roosevelt Hotel (left) started in August and is being pushed in hope of catching some late-winter business.

POZZOLITH CONCRETE

BETTER TODAY . . . BETTER TOMORROW



Boise, Idaho $1,500,000 sewage disposal plant.
Engr.—Alvord, Burdick & Howson, Chicago, Illinois;
Contr. — C. B. Lauch Construction Co., Boise, Idaho.

OTHER MASTER BUILDERS PRODUCTS IN WHICH CEMENT DISPERSION IS EMPLOYED

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For non-shrink grouting and reintegration.

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For "iron-clad" concrete—industry's toughest floor. Noncolored and 11 colors.

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Cement-base paint of low permeability for protecting and decorating exterior and interior surfaces of concrete and masonry.

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For tight brick walls. Provides good workability with 15-20% less water, correct water retentivity. Contains stearate.

Sewage disposal and filtration plant *construction requirements* of—
easy placeability for thin wall sections
low shrinkage and
no segregation
are *standard performance* with Pozzolith Concrete.

Inspection reports from many plants — in operation up to seventeen years — show that Pozzolith also provides the important *service requirements of* —
exceptional resistance to freezing and thawing
resistance to corrosion and
low permeability.

Pozzolith produces these immediate and long term benefits because —

(1) it disperses cement, greatly increasing cement efficiency,
(2) it reduces water, providing low permeability,
(3) it entrains the optimum amount of air, giving great durability,
(4) it conforms with the water cement ratio law, assuring design strengths.

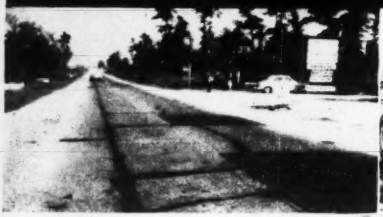
These are also the reasons why Pozzolith produces concrete of any given quality *at lower cost than by any other means.*

Full information and Pozzolith booklet on request.

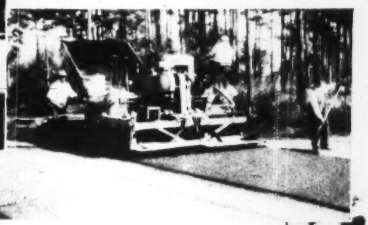
MASTER BUILDERS

CLEVELAND 3, OHIO — TORONTO, ONTARIO

North Carolina tops worn highway with 25 miles of Texaco



Route 301, North Carolina, before construction of new Texaco Asphalt surface.



Laying the first of two courses of plant-mixed Texaco Asphaltic Concrete.

Contractor: Adams and Tate Construction Company of Roanoke, Va.

Old pavement with tack coat of Cutback Asphalt (right); first course of Asphaltic Concrete (left).

Route 301 is one of North Carolina's principal north-south highways, a popular route with many Florida-bound motorists. Last summer, a 25-mile section of this highway south of Fayetteville had deteriorated to the point that some type of improvement became imperative.

The method used by North Carolina to modernize this busy highway is economical, causes minimum inconvenience to traffic and gives the old, worn pavement a new, durable, joint-free wearing surface. Following a light tack coat of Texaco Rapid-Curing Cutback Asphalt, a resilient, heavy-duty Texaco Asphaltic Concrete pavement was constructed in two courses with a combined thickness of 3 inches. The 85-100 penetration asphalt used in the asphaltic concrete mix, also was used as a tack coat between the two courses.

In North Carolina and throughout the rest of the country east of the Rockies, road builders have been constructing and maintaining streets and highways with Texaco Asphaltic products for over 15 years. Refined from selected crudes, this complete family of Asphalt Cements, Cutback Asphalts and Slow-Curing Asphaltic Oils includes a product exactly suited to each road and street need.

Two helpful booklets which describe all types of Asphalt construction can be secured without charge by writing our nearest office.

Note the volume and type of traffic which is served by this State highway.

Completed Texaco Asphaltic Concrete pavement provides smooth, durable, skid-resistant riding surface.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

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TEXACO ASPHALT